United States
Department of
Agriculture

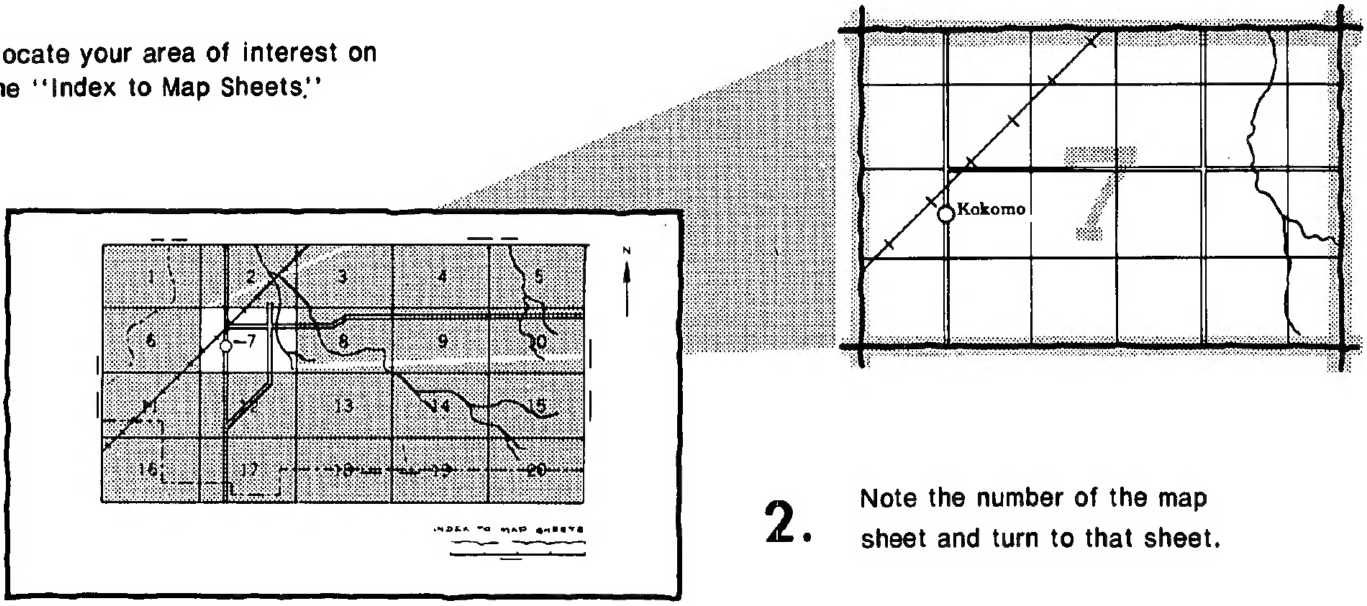
Soil
Conservation
Service

In cooperation with the
Mississippi Agricultural
and Forestry Experiment
Station

Soil Survey of Marion County, Mississippi

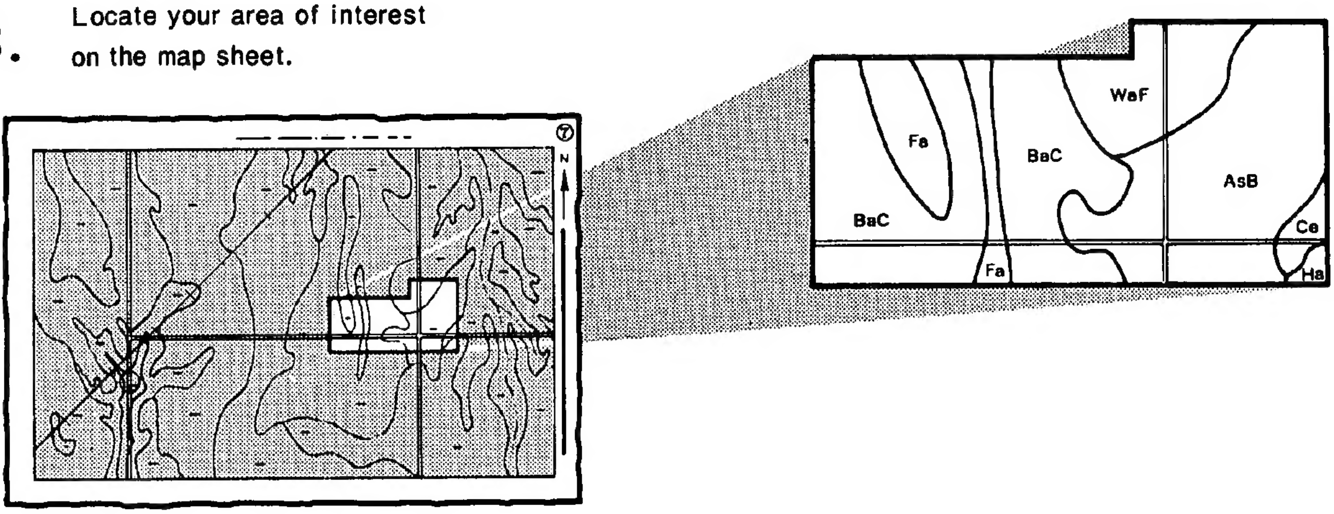
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets."

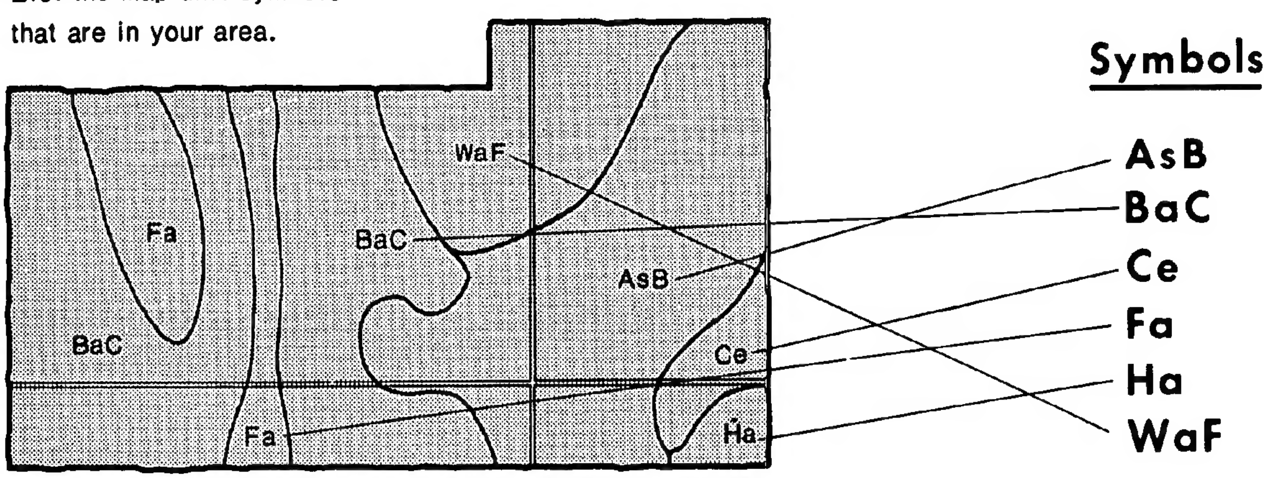


2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.

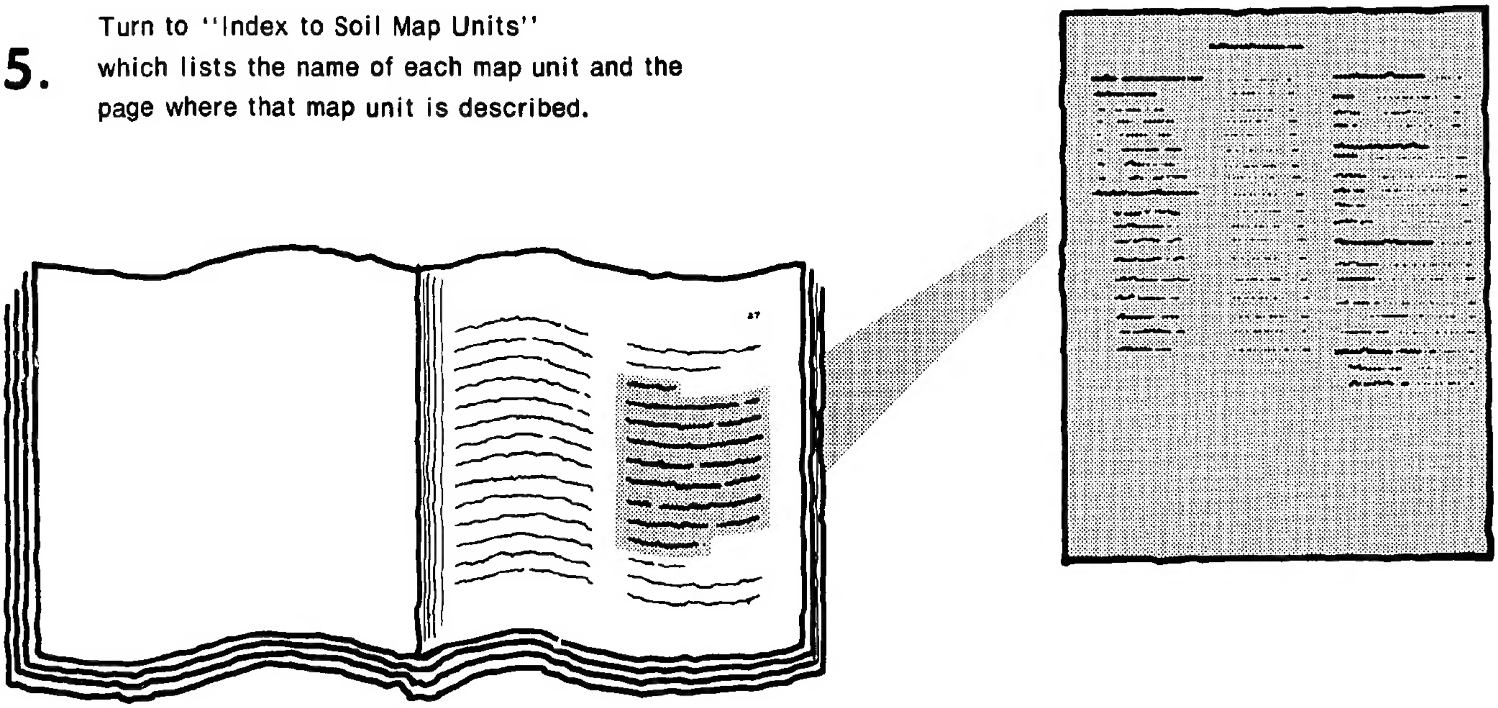


4. List the map unit symbols that are in your area.

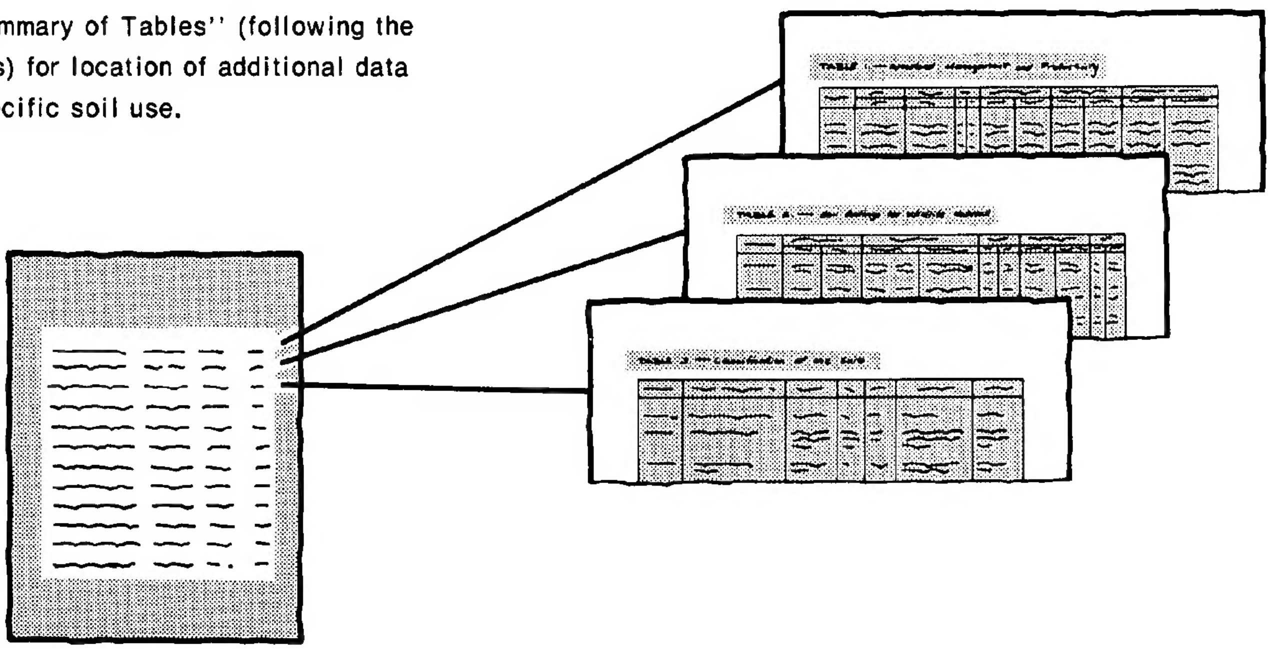


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in 1982. Soil names and descriptions were approved in 1982. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1982. This survey was made cooperatively by the Soil Conservation Service and the Mississippi Agricultural and Forestry Experiment Station. It is part of the technical assistance furnished to the Marion County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

This survey updates the soil survey of Marion County published in 1938.

Cover: The historic Ford House, built on Cahaba fine sandy loam, 0 to 2 percent slopes, is the oldest house in the Pearl River Valley and is listed in the National Register of Historic Buildings. General Andrew Jackson and his troops camped in the area enroute to New Orleans during the War of 1812.

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Soil Series

Issued December 1985

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Summary of Tables

Foreword

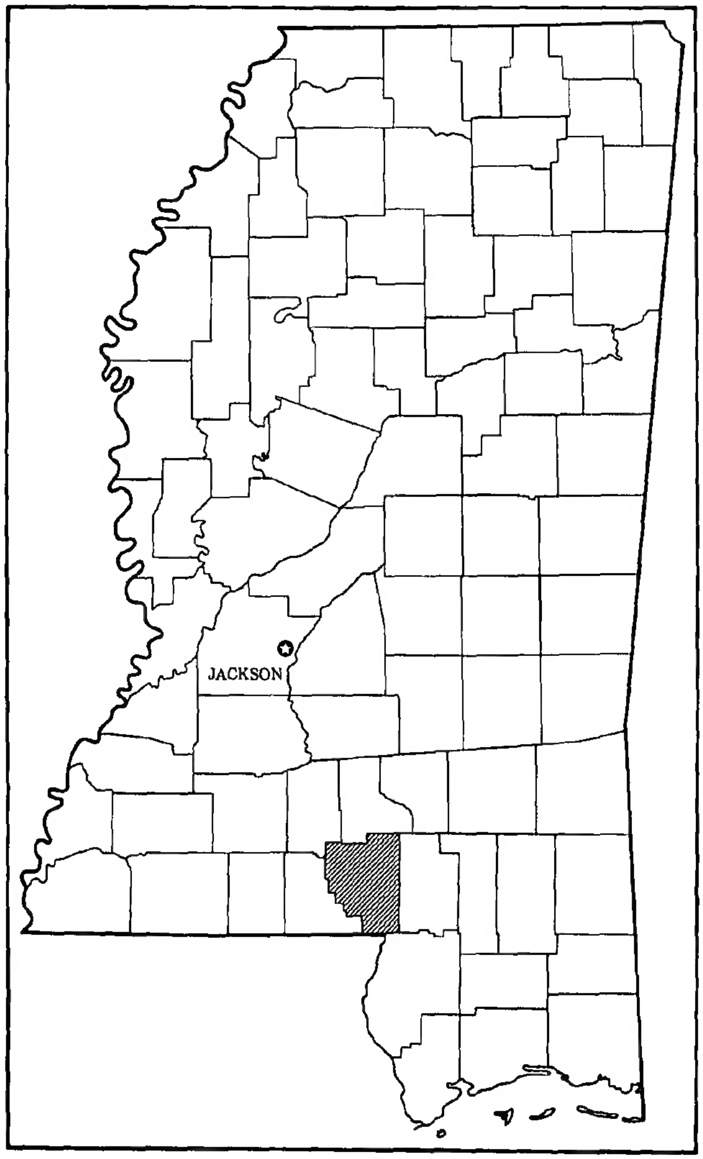
This soil survey contains information that can be used in land-planning programs in Marion County, Mississippi. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Albert E. Sullivan
State Conservationist
Soil Conservation Service



Location of Marion County in Mississippi.

Soil Survey of Marion County, Mississippi

By Paul Nichols, Jr., Albert R. Leggett,
and Charlie M. Breland, Soil Conservation Service

United States Department of Agriculture,
Soil Conservation Service, in cooperation with the
Mississippi Agricultural and Forestry Experiment Station

MARION COUNTY is in the southern part of Mississippi. It has a land area of about 550 square miles, or about 352,000 acres. Included are lakes smaller than 40 acres and streams less than one-eighth of a mile wide. Columbia, the county seat, is in the central part of the county.

The county is bounded on the north by Lawrence and Jefferson Davis Counties, on the east by Lamar County, on the south by Pearl River County and Washington Parish, Louisiana, and on the west by Walthall County. Marion County extends about 23 miles from east to west and almost 30 miles from north to south.

The descriptions, names, and delineations of soils in this survey do not fully agree with those on soil maps for adjacent counties. Differences are the result of better knowledge of soils, modification in series concepts, intensity of mapping, or the extent of the soils within the survey area.

General Nature of the County

This section provides information about the climate; physiography, relief, and drainage; geology; history and development; transportation; and agriculture of Marion County.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Marion County, Mississippi, has long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short with only a rare cold wave that moderates in 1 or 2 days. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare. Summer precipitation, mainly afternoon thunderstorms, is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Columbia, Mississippi, in the period 1951 to 1980. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 51 degrees F, and the average daily minimum temperature is 39 degrees. The lowest temperature on record, which occurred at Columbia on December 13, 1962, is 6 degrees. In summer the average temperature is 81 degrees, and the average daily maximum temperature is 92 degrees. The highest recorded temperature, which occurred on June 14, 1963, is 105 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

Of the total annual precipitation, 29 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 24 inches. The heaviest 1-day rainfall during the period of record was 9.23 inches at Columbia on April l3, 1955. Thunderstorms occur on about 65 days each year, and most occur in summer.

Snowfall is rare. In 90 percent of the winters, there is no measurable snowfall. In 10 percent, the snowfall, usually of short duration, is more than 2 inches. The

heaviest 1-day snowfall on record was more than 3 inches.

The average relative humidity in midafternoon is about 65 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The sun shines 65 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 9 miles per hour, in winter.

Severe local storms, including tornadoes, strike occasionally in or near the area. They are short and cause variable and spotty damage. Every few years in summer or autumn, a tropical depression or remnant of a hurricane that has moved inland causes extremely heavy rains for 1 to 3 days.

Physiography, Relief, and Drainage

Michael C. Seal, geologist, Mississippi Bureau of Geology, Jackson, Mississippi, prepared this section *(10)*.

Mississippi is in the Gulf Coastal Plain physiographic province of North America. The state has been further subdivided into 12 physiographic units.

Marion County is in the Piney Woods physiographic unit. The topography of the county is hilly to moderately rolling with low-lying flat areas on the flood plains of the Pearl River and its tributaries. The highest elevation in Marion County is slightly more than 500 feet above sea level in the northwestern part of the county; elevation on the Pearl River flood plain is about 125 feet above sea level. Therefore, the maximum surface relief is approximately 375 feet in the county.

Marion County is drained by the Pearl River and its tributaries. Freshwater wetlands are extensive on the flood plain in the southern part of the county.

Geology

Miocene-age sediments of the Pascagoula Formation or Hattiesburg Formation, or both, unconformably underlie the Citronelle Formation. The thickness varies from 300 to 1,000 feet in the county. The Hattiesburg Formation consists of nonmarine, massive, blue and gray clay that has sand and sandstone lenses. The Pascagoula Formation consists of green, gray, and blue clays interbedded with green and gray sands. Miocene formations in this area provide water to wells for municipal, domestic, and industrial use.

The upland areas in Marion County are characterized by Pliocene-Pleistocene fluvial deposits of the Citronelle Formation. The Citronelle Formation consists of sand that has local lenses of clay and gravel. The Citronelle Formation is about 150 feet thick or less and can be used as a source for domestic water.

Terrace deposits of Pleistocene age associated with the Pearl River are along the valley walls. These are lithologically similar to the Citronelle Formation and could possibly be used locally for wells for domestic water.

Quaternary alluvial deposits are on the flood plains *(3,5)* of the Pearl River and its tributaries (fig. l).

History and Development

Marion County was admitted to the Mississippi Territory in 1811. The county was named in honor of General Francis Marion, the noted "Swamp Fox" of South Carolina *(8)*, who distinguished himself in the Revolutionary War.

In 1820, when the county area was much larger, it had a population of only 3,110. Between 1890 and 1914 parts of Marion County were subdivided to form Pearl River, Lamar, and Walthall Counties *(9)*.

The population of Marion County in 1930 was 19,923. By 1980 it had only increased to 25,708 *(11)*.

Columbia is the county seat. It was founded soon after Mississippi became a territory of the United States in 1798. Columbia was first known as Lotts Bluff, but later the early settlers changed its name to Columbia because it reminded them of Columbia, South Carolina, from where they had originated *(8)*.

Columbia was the temporary capital of Mississippi until 1822, and during this time two sessions of the legislature were held here; one was held in November 1821 and the other in June 1822 *(12)*. The capital was moved to Jackson in 1822.

In the southern part of Marion County is the John Ford home, one of the oldest homes in Mississippi. It was built before 1810. The original owner, Reverend John Ford, was instrumental in the formation of Marion County in 1811. He also was a delegate to the first Mississippi Constitutional Convention. The historic Pearl River Convention, which was held in Marion County, met at the Ford Home. At this convention, a representative was chosen to meet with Congress in Washington D.C. Subsequently, the Mississippi Territory was divided into two parts. These divided parts became the states of Mississippi and Alabama.

Transportation

Transportation facilities in Marion County include the municipal airport and a railroad that runs from Chicago, Illinois, to New Orleans, Louisiana. The county also is traversed from north to south by Mississippi State Highways 13 and 35 and from east to west by U.S. Highway 98. Mississippi State Highway 44 is in a northeasterly direction from Columbia to Sumrall, Mississippi.

Agriculture

Marion County is mostly an agricultural area. Forest products, livestock, dairy products, corn, wheat, soybeans, and watermelons are the important cash crops. There are small acreages of potatoes, hay, and rice (fig. 2).

ERA	SYSTEM	SERIES	STRATIGRAPHIC UNIT	APPROXIMATE THICKNESS (feet)	LITHOLOGIC CHARACTER
CENOZOIC	QUATERNARY	RECENT	Alluvium	0–50	Sand, gravel, and clay lenses. May contain organic material.
		PLEISTOCENE	Terrace Deposits	0–50	Sand, gravel, silt, and clay. May contain organic material.
			Citronelle Formation	0–150	Sand, gravel, and clay lenses. Occupies higher elevations.
	TERTIARY	PLIOCENE			
		MIOCENE	Hattiesburg and/or Pascagoula Formation	300–1000(?)	Hattiesburg Formation: non-marine massive blue and gray clay with sand and sandstone lenses. Pascagoula Formation: green, gray, and blue clay interbedded with green and gray sands.

Figure I.—Generalized section of strata exposed in Marion County.

About 55 percent of the county, or approximately 194,000 acres, is commercial forest. Large paper companies own large tracts of the acreage.

Beef and dairy cattle are the main livestock enterprises. Soybeans is the most extensively cultivated crop. About 6,000 acres was planted to soybeans in 1981 *(7)*. About 4,500 acres of corn, 2,900 acres of wheat, 500 acres of watermelons, and 300 acres of rice are grown in Marion County. There are also some catfish farms in the county.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils

Figure 2.—Harvesting rice in an area of Guyton silt loam, frequently flooded.

were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions,

and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed, and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Soil Descriptions

Dominantly nearly level to steep, well drained and moderately well drained soils that have a loamy subsoil; on uplands

In this group are four map units that are made up of nearly level to steep soils. The soils are on broad ridges and short hillsides. The major soils are Lucy, Ruston, Saffell, Savannah, and Smithdale soils. These soils are well drained and moderately well drained and have a loamy subsoil. The Saffell soils contain gravel, and the Savannah soils have a fragipan. The slopes range from 0 to 40 percent. These map units make up about 66 percent of the county.

1. Smithdale-Ruston-Savannah

Nearly level to steep, well drained and moderately well drained, loamy soils; on broad upland ridges and short hillsides

This map unit mainly consists of large areas in the northeastern, west-central, and southwestern parts of the county. The landscape mainly is rolling. It is marked by ridges that are generally less than one-fourth mile wide, by sloping to steep hillsides, and by narrow drainageways. The uplands are dissected by many short drainageways and by narrow flood plains. The slopes range from 0 to 35 percent.

This map unit makes up about 42 percent of the county. It is about 35 percent Smithdale soils, 25 percent Ruston soils, 16 percent Savannah soils, and 24 percent soils of minor extent.

Smithdale soils are well drained. They formed in loamy material on upland hillsides. Ruston soils are well drained. They formed in loamy material on upland ridges. Savannah soils are moderately well drained. These soils have a fragipan. They formed in loamy material on upland ridges.

The soils of minor extent in this map unit are Benndale and Stough soils on uplands and stream terraces, McLaurin, Petal, and Saffell soils on upland ridges and hillsides, and Prentiss soils on stream terraces.

The soils in this map unit mainly are in woodland, and they are well suited to this use. A small acreage is in row crops or pasture. The nearly level and gently sloping areas of Ruston and Savannah soils are well suited to cultivated crops and to pasture grasses and legumes. Smithdale soils are poorly suited to row crops because of steepness of slope and moderately suited to pasture grasses and legumes. If the slope is more than 15 percent, Smithdale soils are poorly suited to pasture grasses and legumes.

The gently sloping Ruston soils have slight limitations for urban uses. Smithdale soils have severe limitations for urban uses because of steepness of slope. The nearly level and gently sloping Savannah soils have moderate limitations for urban uses because of wetness.

Potential for the development of habitat for openland wildlife is good on Ruston and Savannah soils and fair on Smithdale soils. Potential for the development of habitat for woodland wildlife is good on Smithdale, Ruston, and Savannah soils, but these soils have very poor potential for the development of habitat for wetland wildlife.

2. Smithdale-Lucy-Ruston

Gently sloping to steep, well drained, loamy and sandy soils; on narrow upland ridges and long hillsides

This map unit mostly is in one large area in the southeastern part of the county. The landscape mainly is hilly. It is marked by ridges that are generally less than one-fourth mile wide, by sloping to steep hillsides, and by narrow drainageways. The uplands are dissected by

many short drainageways and by narrow flood plains. The slopes range from 2 to 40 percent.

This map unit makes up about 7 percent of the county. It is about 40 percent Smithdale soils, 21 percent Lucy soils, 17 percent Ruston soils, and 22 percent soils of minor extent.

Smithdale soils are well drained. They formed in loamy material on upland hillsides. Lucy soils are well drained. They formed in loamy material on hillsides. Ruston soils are well drained. They formed in loamy material on upland ridges.

The soils of minor extent in this map unit include the well drained Benndale and McLaurin soils on upland ridges, the well drained Saffell soils on upland hillsides, and the poorly drained Bibb soils on flood plains and in drainageways. Also included is a well drained soil on upland hillsides that has a sandy surface layer more than 40 inches thick.

The soils in this map unit mainly are in woodland. A small acreage is in row crops or pasture. The gently sloping Ruston soils on ridges are well suited to cultivated crops and to pasture grasses and legumes. Smithdale soils are poorly suited to row crops and moderately suited to pasture because of steep slopes. If the slope is more than 15 percent, Lucy and Smithdale soils are poorly suited to row crops and to pasture grasses and legumes.

The Smithdale and Ruston soils are well suited to use as woodland. Lucy soils are moderately suited to this use because of moderate productivity.

Smithdale and Lucy soils have severe limitations for urban uses because of steepness of slope. The gently sloping Ruston soils have slight limitations for urban uses.

Potential for the development of habitat for openland wildlife is good on Ruston soils and fair on Smithdale and Lucy soils. Potential for development of habitat for woodland wildlife is good on Smithdale, Lucy, and Ruston soils, but these soils have very poor potential for the development of habitat for wetland wildlife.

3. Smithdale-Saffell-Lucy

Sloping to steep, well drained, loamy, gravelly, and sandy soils; on narrow upland ridges and long hillsides

This map unit consists of one large area in the northwestern part of the county. The landscape mainly is hilly. It is marked by ridges that are generally less than one-fourth mile wide, by sloping to steep hillsides, and by narrow drainageways. The uplands are dissected by many short drainageways and narrow flood plains. The slopes range from 5 to 40 percent.

This map unit makes up about 7 percent of the county. It is about 43 percent Smithdale soils, 26 percent Saffell soils, 18 percent Lucy soils, and 13 percent soils of minor extent.

Smithdale soils are well drained. They formed in loamy material on upland hillsides. Saffell soils are well drained. They formed in loamy and gravelly material on upland hillsides. Lucy soils are well drained. They formed in loamy material on upland hillsides.

The soils of minor extent in this map unit include the poorly drained Bibb soils in drainageways and on flood plains and the well drained Ruston soils on upland ridges. Also included are well drained soils on upland hillsides that have a sandy surface layer more than 40 inches thick.

The soils in this map unit mainly are in woodland. A small acreage is in row crops or pasture. Smithdale, Saffell, and Lucy soils are poorly suited to cultivated crops and to pasture grasses and legumes because of the steepness of the slope. If the slope is less than 15 percent, Smithdale soils are moderately suited to pasture.

Smithdale soils are well suited to use as woodland. Saffell soils are poorly suited to this use, and Lucy soils are moderately suited because of limited productivity.

Smithdale, Saffell, and Lucy soils are severely limited for urban uses because of steepness of slope.

Potential for the development of habitat for openland wildlife is fair on Smithdale, Saffell, and Lucy soils. Potential is good for the development of habitat for woodland wildlife on Smithdale and Lucy soils and fair on Saffell soils, but these soils have very poor potential for the development of habitat for wetland wildlife.

4. Savannah-Ruston-Smithdale

Nearly level to gently sloping, moderately well drained and well drained, loamy soils; on broad upland ridges and short hillsides

This map unit consists of one large area in the western part of the county. The landscape mainly is gently undulating. It is marked by nearly level and gently sloping ridges that are generally less than one-fourth mile wide, by gently sloping and sloping side slopes, and by narrow drainageways. The slopes are dissected by many short drainageways and narrow flood plains. The slopes range from 0 to 8 percent.

This map unit makes up about 10 percent of the county. It is about 42 percent Savannah soils, 19 percent Ruston soils, 10 percent Smithdale soils, and 29 percent soils of minor extent.

Savannah soils are moderately well drained. These soils have a fragipan. They formed in loamy material on upland ridges and hillsides. Ruston soils are well drained. They formed in loamy material on upland ridges and hillsides. Smithdale soils are well drained. They formed in loamy material on upland hillsides.

The soils of minor extent in this map unit are McLaurin soils on upland ridges, Prentiss soils on stream terraces, and Stough soils on nearly level, low upland flats and stream terraces.

The soils in this map unit are used mainly as pasture and cropland. A small acreage is in woodland. The soils

that are on nearly level and gently sloping ridges are well suited to cultivated crops and to pasture grasses and legumes. Those on sloping ridges and hillsides are moderately suited to cultivated crops and well suited to pasture grasses and legumes.

The Savannah, Ruston, and Smithdale soils are well suited to use as woodland.

Ruston soils have slight limitations for urban uses. Wetness is a moderate limitation for urban uses on Savannah soils, and low strength is a moderate limitation for roads and streets. Smithdale soils have moderate limitations for urban uses because of steepness of slope. Steepness of slope is a severe limitation for use of Smithdale soils for small commercial buildings.

Potential for the development of habitat for openland and woodland wildlife is good on Ruston, Savannah, and Smithdale soils, but these soils have very poor potential for the development of habitat for wetland wildlife.

Dominantly nearly level to gently sloping, somewhat poorly drained and well drained soils that have a loamy subsoil; on uplands

Only one map unit is in this group. The soils in this map unit are on broad upland ridges and short hillsides. The slopes are nearly level to gently sloping.

The major soils are the Benndale and Falkner soils. The Falkner soils are somewhat poorly drained. These soils have a subsoil that is silty in the upper part and clayey in the lower part. The Benndale soils are well drained. They have a loamy subsoil. The slopes range from 0 to 5 percent. This map unit makes up about 3 percent of the county.

5. Falkner-Benndale

Nearly level to gently sloping, somewhat poorly drained and well drained, silty and loamy soils; on broad upland ridges and short hillsides

This map unit consists of two large areas in the east-central part of the county. The landscape mainly is gently undulating. It is marked by ridges that are generally less than one-fourth mile wide, by gently sloping and sloping hillsides, and by narrow drainageways. The hillsides are dissected by many short drainageways and narrow flood plains. The slopes range from 0 to 5 percent.

This map unit makes up about 3 percent of the county. It is about 48 percent Falkner soils, 32 percent Benndale soils, and 20 percent soils of minor extent.

Falkner soils are somewhat poorly drained. They formed in a mantle of silty material underlain by clayey deposits on upland ridges and hillsides. Benndale soils are well drained. They formed in loamy material on upland ridges and hillsides.

The soils of minor extent in this map unit are the Savannah and Susquehanna soils on upland ridges and hillsides, Bibb soils in narrow drainageways and on flood plains, and Stough soils in low positions on uplands and stream terraces.

The soils in this map unit mainly are in woodland, and they are well suited to this use. A small acreage is in row crops or pasture. Falkner soils are moderately suited to cultivated crops, and Benndale soils are well suited to this use. Falkner and Benndale soils are well suited to pasture grasses and legumes.

Falkner soils have severe limitations for urban uses because of wetness and the high shrink-swell properties of the subsoil. The Benndale soils have slight limitations for urban uses.

Potential for the development of habitat for openland and woodland wildlife is good on Benndale and Falkner soils, but these soils have very poor potential for the development of habitat for wetland wildlife.

Dominantly gently sloping to steep, moderately well drained and somewhat poorly drained, loamy soils that have a loamy or clayey subsoil; on uplands

Only one map unit is in this group. The soils in this map unit are on broad upland ridges and short hillsides. The slopes are gently sloping to steep.

The major soils are the Petal and Susquehanna soils. The Petal soils are moderately well drained, and the Susquehanna soils are somewhat poorly drained. These soils have a clayey subsoil. The slopes range from 2 to 20 percent. This map unit makes up about 5 percent of the county.

6. Petal-Susquehanna

Gently sloping to steep, moderately well drained and somewhat poorly drained, loamy soils; on broad upland ridges and short hillsides

This map unit consists of three large areas in the southeastern part of the county. The landscape is mainly rolling. It is marked by ridges that are generally less than one-fourth mile wide, by sloping to steep hillsides, and by narrow drainageways. The hillsides are dissected by many short drainageways and narrow flood plains. The slopes range from 2 to 20 percent.

This map unit makes up about 5 percent of the county. It is about 36 percent Petal soils, 26 percent Susquehanna soils, and 38 percent soils of minor extent.

Petal soils are moderately well drained. They formed in loamy and clayey material on upland hillsides. Susquehanna soils are somewhat poorly drained. They formed in clayey material on upland ridges and hillsides.

The soils of minor extent in this map unit are Benndale and Ruston soils on upland ridges, Lucy and Smithdale

soils on hillsides, and Bibb soils in drainageways and on flood plains.

The soils in this map unit mainly are in woodland. A small acreage is in row crops or pasture. The Petal and Susquehanna soils are poorly suited to cultivated crops and moderately suited to pasture grasses and legumes because of steepness of slope and low productivity.

Petal soils are well suited to use as woodland, and Susquehanna soils are moderately suited to this use.

Petal and Susquehanna soils have severe limitations for urban uses because of wetness, high shrink-swell potential of the subsoil, and steepness of slope.

Potential for the development of habitat for openland and woodland wildlife is good on Petal and Susquehanna soils, but these soils have very poor potential for the development of habitat for wetland wildlife.

Dominantly nearly level, well drained to poorly drained soils that have a loamy or silty subsoil; on broad flood plains

In this group are two map units that are made up of nearly level soils. The soils are on wide flood plains and in narrow drainageways. The major soils are Bibb, Cascilla, Chenneby, and Jena soils. These soils are well drained to poorly drained and have a loamy or silty surface layer. All of these soils are subject to flooding. The slopes range from 0 to 2 percent. These map units make up about 16 percent of the county.

7. Jena-Cascilla-Chenneby

Nearly level, well drained and somewhat poorly drained, loamy and silty soils; on broad flood plains

This map unit is in the central part of Marion County. It consists of one large area that extends from the north to the south along the Pearl River. The landscape is a nearly level, densely wooded flood plain that is dissected by many short drainageways and small old runs (fig. 3). The slopes range from 0 to 2 percent.

This map unit makes up about 10 percent of the county. It is about 34 percent Jena soils, 23 percent Cascilla soils, 14 percent Chenneby soils, and 29 percent soils of minor extent.

Jena, Cascilla, and Chenneby soils are on the broad flood plains of the Pearl River. The Jena soils are well drained. They formed in loamy material. The Cascilla soils are well drained, and the Chenneby soils are somewhat poorly drained. These soils formed in silty material.

The soils of minor extent in this map unit include the excessively drained Nugent soils on flood plains and some soils that are somewhat poorly drained and have a silty clay loam subsoil. These soils are in low positions on the landscape. Also included are poorly drained soils that have a grayish silty clay loam subsoil. These soils are in depressions, sloughs, and small drainageways.

The soils in this map unit are in woodland, and they are well suited to this use. In some small areas, sand and gravel are mined. Jena, Cascilla, and Chenneby soils are poorly suited to cultivated crops and are moderately suited to pasture grasses and legumes because of flooding during the growing season.

The soils in this map unit have severe limitations for urban uses because of flooding and wetness.

The potential of the soils in this map unit for the development of habitat for openland wildlife is fair. Jena, Cascilla, and Chenneby soils have good potential for the development of habitat for woodland wildlife. For the development of habitat for wetland wildlife, Jena soils have poor potential, Cascilla soils have very poor potential, and Chenneby soils have fair potential.

8. Bibb-Jena

Nearly level, poorly drained and well drained, silty and loamy soils; on narrow flood plains

This map unit consists of several small areas that are scattered throughout the county. The landscape is nearly level flood plains that are dissected by drainageways and small creeks. Most areas are densely wooded. The slopes range from 0 to 2 percent.

This map unit makes up about 6 percent of the county. It is about 46 percent Bibb soils, 23 percent Jena soils, and 3l percent soils of minor extent.

Bibb soils are poorly drained. They formed in stratified loamy material on flood plains and in drainageways. Jena soils are well drained. They formed in loamy sediment on flood plains.

The soils of minor extent in this map unit are the very poorly drained Croatan and Dorovan soils on low elevations in drainageways and on flood plains and the somewhat poorly drained Stough soils on stream terraces.

The soils in this map unit mainly are in use as woodland, and they are well suited to this use. A small acreage is in pasture. These soils are poorly suited to cultivated crops and moderately suited to pasture grasses and legumes because of flooding.

These Bibb and Jena soils have severe limitations for urban uses because of wetness and flooding.

Potential for the development of habitat for openland wildlife is fair on Bibb and Jena soils. Potential for the development of habitat for woodland wildlife is fair on Bibb soils and good on Jena soils. Potential for the development of habitat for wetland wildlife is good on Bibb soils and poor on Jena soils.

Figure 3.—An old run in an area of the Jena-Cascilla-Chenneby general soil map unit.

Dominantly nearly level, well drained and somewhat poorly drained soils that have a loamy subsoil; on broad stream terraces

Only one map unit is in this group. The soils are on broad stream terraces. The slopes are nearly level.

The major soils are the Cahaba, Latonia, and Stough soils. These soils are well drained to somewhat poorly drained and have a loamy subsoil. The slopes range from 0 to 2 percent. This map unit makes up about 10 percent of the county.

9. Latonia-Cahaba-Stough

Nearly level, well drained and somewhat poorly drained, loamy soils; on broad stream terraces

This map unit consists of several small areas that extend from the north to the south of the county. These areas are near the Pearl River flood plain. The landscape is mainly nearly level and is dissected by many short drainageways. The slopes range from 0 to 2 percent.

This map unit makes up about 10 percent of the county. It is about 40 percent Latonia soils, 28 percent Cahaba soils, 22 percent Stough soils, and 10 percent soils of minor extent.

Latonia and Cahaba soils are well drained. They formed in loamy material on stream terraces. Stough soils are somewhat poorly drained. They formed in loamy material on stream terraces.

The soils of minor extent in this map unit are the poorly drained Bibb soils in drainageways and on flood plains, the well drained Bassfield soils and the moderately well drained Prentiss soils on stream terraces, and the moderately well drained Savannah soils on uplands and stream terraces.

The soils in this map unit mainly are in pasture or row crops. A small acreage is in woodland. Latonia, Cahaba, and Stough soils are well suited to cultivated crops and

to pasture grasses and legumes. Latonia soils are somewhat droughty.

The Latonia, Cahaba, and Stough soils are well suited to use as woodland.

Latonia and Cahaba soils have slight limitations for urban uses. Stough soils have severe limitations because of a seasonal high water table.

Potential for the development of habitat for openland wildlife and woodland wildlife is good on the soils in this map unit. For the development of habitat for wetland wildlife, Latonia and Cahaba soils have very poor potential, and Stough soils have fair potential.

Broad Land Use Considerations

The soils in Marion County vary widely in their suitabilities and limitations for major land uses. According to the 1978 Census of Agriculture, land used for harvested crops made up about 6 percent of the total land area. Soybeans, corn, wheat, and watemelons are the main crops harvested in the county. A small acreage of rice is grown. This cropland is mainly in map units 1, 5, and 9. The erosion hazard is slight or moderate on the nearly level or gently sloping ridges. Moderately steep and steep side slopes are significant limitations for cropland use in map unit 1. Only a few crops are grown on soils in map units 2, 6, 7, and 8. There are hardly any crops grown in map units 3, 4, and 9.

Pasture makes up about 11 percent of the land area in the county. Most of the pasture is on the soils of map units 1, 5, and 9. Many of these soils are well suited or moderately suited to pasture grasses and legumes.

Woodland makes up most of the land area in the county, about 55 percent. The soils of map units 1, 4, 5, 7, 8, and 9 are well suited to use as woodland. Most of the soils of map units 2, 3, and 6 are well suited to this use. Lucy soils of map units 2 and 3 and Susquehanna soils of map unit 6 are moderately suited to use as woodland, mainly, because of low productivity. Hardwoods are adapted to the soils in the drainageways and on flood plains, and loblolly pine, longleaf pine, and slash pine are dominant on the uplands.

About 28 percent of the land area in Marion County has been developed into urban areas or built-up areas or has been developed for miscellaneous land uses.

The soils in map units 2, 3, and 6 have severe limitations for urban uses because of steepness of slope. The soils in map units 7 and 8 have severe limitations for urban uses because of wetness or flooding. These soils are along the Pearl River in the central part of the county, in the east-central part of the county, and in drainageways throughout the county. In the northeastern, central, and western parts of the county, soils on the nearly level and gently sloping ridges of map units 1, 5, and 9 have slight limitations or moderate limitations for urban uses because of wetness. These are the most suitable soils for urban development in Marion County.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Savannah fine sandy loam, 2 to 5 percent slopes, is one of several phases in the Savannah series.

Some map units are made up of two or more major soils. These map units are called soil complexes or soil associations.

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Johnston-Croatan complex, frequently flooded, is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Smithdale-Lucy association, hilly, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits-Udorthents complex is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

BaA—Bassfield sandy loam, 0 to 2 percent slopes. This nearly level, well drained soil formed in loamy marine deposits or in stream deposits. This soil is on stream terraces.

Typically, the surface layer is brown sandy loam about 6 inches thick. The subsurface layer is brown sandy loam to a depth of about 10 inches. The subsoil extends to a depth of about 4l inches. The upper part of the subsoil, to a depth of about 14 inches, is yellowish red loam that has brownish mottles; the middle part is red loam to a depth of 32 inches; the lower part is yellowish red sandy loam that has brownish mottles. The underlying material, to a depth of about 62 inches, is strong brown sandy loam. Below that, it is reddish yellow loamy sand to a depth of 75 inches.

This Bassfield soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderately rapid in the subsoil and rapid in the underlying material. The available water capacity is moderate. Runoff is slow, and the hazard of erosion is slight, There is no seasonal high water table

within a depth of 6 feet. The surface layer is friable and is easily tilled through a wide range of moisture content.

Included with this soil in mapping are small areas of Bibb, Cahaba, and Latonia soils. Bibb soils are in drainageways and on flood plains. Cahaba and Latonia soils are on stream terraces. Also included are a few small areas of soils that have a fine sandy loam surface layer.

In most areas, this Bassfield soil is used for row crops or as pasture. A small acreage is in woodland.

This soil is well suited to corn, soybeans, and small grains. It is somewhat droughty. Fertilizer is leached from this soil faster than in soils that have slower permeability. Returning crop residue to the soil, conservation tillage, and aligning crop rows to remove excess surface water are recommended conservation practices.

This soil is well suited to grasses and legumes for hay and pasture. Good pasture management includes proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine, slash pine, shortleaf pine, cherrybark oak, and sweetgum. Woodland management limitations are slight.

This soil has slight limitations for most urban uses. It is severely limited for septic tank absorption fields because the sandy underlying material is a poor filter for the effluent.

This Bassfield soil is in capability subclass IIs and in woodland suitability group 2o7.

Bb—Bibb silt loam, frequently flooded. This nearly level, poorly drained soil formed in stratified loamy alluvium on narrow flood plains. This soil is subject to brief periods of frequent flooding, generally in the winter and during part of the growing season. The slope ranges from 0 to 2 percent.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsurface layer is gray silt loam mottled in shades of brown to a depth of about 11 inches. The underlying material extends to a depth of about 75 inches. The upper part is light brownish gray fine sandy loam mottled in shades of brown and yellow to a depth of about 18 inches. The next layer, to a depth of about 62 inches, is light gray sandy loam or loam mottled in shades of brown. The lower part is light brownish gray sandy loam mottled in shades of brown and yellow.

This Bibb soil is very strongly acid or strongly acid throughout. Permeability is moderate. The available water capacity is high. Runoff is very slow, and the hazard of erosion is slight. The seasonal high water table is near the surface during wet seasons.

Included with this soil in mapping are small areas of Stough soils. These soils are on stream terraces and upland flats.

Most of the acreage of this Bibb soil is used as woodland, mainly mixed hardwoods and pines. A small acreage is in pasture. This soil is poorly suited to row crops and small grains because of frequent flooding and seasonal wetness.

Wetness and flooding limit the choice of pasture plants, restrict cutting and grazing during periods of wetness, and decrease plant survival. However, this soil is moderately suited to grasses and legumes for hay or pasture. Surface field ditches are needed to remove excess surface water. Good pasture management includes proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to eastern cottonwood, sweetgum, water oak, yellow-poplar, blackgum, loblolly pine, and slash pine. Flooding and a high water table in winter and early in the spring are severe limitations for the use of equipment on the soil and in managing and harvesting the tree crops. These limitations can be partially overcome by logging during drier periods. Seedling mortality and plant competition are severe limitations.

This soil has severe limitations for urban uses because of flooding and wetness. Flooding and wetness also are severe limitations for septic tank absorption fields.

This Bibb soil is in capability subclass Vw and in woodland suitability group 2w9.

CaA—Cahaba fine sandy loam, 0 to 2 percent slopes. This nearly level, well drained soil formed in loamy sediment. This soil is on stream terraces.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsurface layer is brown loam and yellowish red sandy clay loam to a depth of about 8 inches. The upper part of the subsoil is red sandy clay loam to a depth of about 24 inches. The lower part is yellowish red loam to a depth of about 38 inches. The underlying material to a depth of 80 inches is yellowish red grading to strong brown sandy loam.

This slightly eroded soil has a few rills. In some areas, there is evidence of accelerated erosion on the surface layer but not enough to greatly modify the thickness or the character of the original plow layer.

This soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate. The available water capacity is moderate. Runoff is slow, and the hazard of erosion is slight. There is no seasonal high water table within a depth of 6 feet. The surface layer is friable and is easily tilled through a wide range of moisture content.

Included with this soil in mapping are small areas of Latonia and Prentiss soils. These soils are on stream terraces. Also included are small areas of soils that have a sandy loam surface layer.

In most areas, this Cahaba soil is used as cropland or pasture. The remainder is in woodland.

This soil is well suited to corn, soybeans, and small grains. Conservation tillage and returning crop residue to the soil are recommended conservation practices.

Alignment of crop rows is needed in places to help remove excess surface water.

This soil is well suited to grasses and legumes for hay or pasture. Proper stocking, controlled grazing, and weed and bush control help keep the soil and pasture in good condition.

This soil is well suited to loblolly pine, slash pine, sweetgum, and yellow-poplar. Woodland management limitations are slight, except for plant competition, which is moderate.

This soil has slight limitations for most urban uses and for septic tank absorption fields. Plans for homesites should provide for the preservation of trees.

This Cahaba soil is in capability class I and in woodland suitability group 2o7.

Cb—Cascilla silt loam, frequently flooded. This nearly level, well drained soil formed in silty alluvium on flood plains. This soil is subject to brief periods of frequent flooding in the winter and during part of the growing season. The slope ranges from 0 to 2 percent.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The upper part of the subsoil, to a depth of about 12 inches, is dark yellowish brown silt loam. The next layer, to a depth of about 30 inches, is yellowish brown silt loam. The lower part of the subsoil is yellowish brown silt loam mottled in shades of brown. It extends to a depth of about 48 inches. The underlying material to a depth of 80 inches is yellowish brown fine sandy loam.

This soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate. The available water capacity is high. Runoff is slow, and the hazard of erosion is slight. There is no seasonal high water table within a depth of 6 feet.

Included with this soil in mapping are small areas of Chenneby and Jena soils. These soils are on flood plains.

In most areas, this Cascilla soil is used as woodland. A small acreage is used for pasture.

Cascilla soil is poorly suited to cultivated crops and small grains because of frequent flooding and seasonal wetness.

This soil is moderately suited to grasses and legumes for hay or pasture. Concerns in management include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to cherrybark oak, eastern cottonwood, loblolly pine, water oak, sweetgum, Nuttall oak, and yellow-poplar. During periods of extreme wetness and because of frequent flooding, the use of equipment on this soil is moderately limited. Seedling mortality and plant competition also are moderate limitations.

This soil has severe limitations for urban uses and for septic tank absorption fields mainly because of flooding. Low strength is a severe limitation for local roads and streets.

This Cascilla soil is in capability subclass IVw and in woodland suitability group 1w7.

CC—Cascilla-Chenneby association, frequently flooded. This map unit consists of nearly level, well drained and somewhat poorly drained soils that formed in silty alluvium on the flood plain of the Pearl River. These soils are in a regular and repeating pattern. Many old sloughs (fig. 4), ox-bow lakes, and channel cutoffs are on the flood plains. The soils in this association are in densely wooded areas that are 1/4 to 1/2 mile wide. These wooded areas consist mostly of bottom land hardwoods. In winter and during part of the growing season, these soils are subject to frequent flooding for long periods. Areas range from about 200 to more than 1,000 acres. The composition of the mapped areas varies, but mapping has been controlled well enough for the expected uses of the soils. The slope ranges from 0 to 2 percent.

The Cascilla soil is well drained. It is on higher elevations on the flood plains. The Chenneby soil is somewhat poorly drained, and it is in lower positions on the flood plains.

Cascilla soil makes up about 45 percent of the map unit. Typically, the surface layer is dark brown silt loam about 5 inches thick. The upper part of the subsoil is dark yellowish brown silt loam. It extends to a depth of about 15 inches. The lower part is yellowish brown silt loam mottled in shades of brown. It extends to a depth of about 46 inches. Below that, the underlying material to a depth of about 62 inches is yellowish brown fine sandy loam mottled in shades of brown and gray.

Cascilla soil is very strongly acid or strongly acid throughout. Permeability is moderate. The available water capacity is high. Runoff is slow, and the hazard of erosion is slight. There is no seasonal high water table within a depth of 6 feet.

Chenneby soil makes up about 31 percent of the map unit. Typically, the surface layer is dark brown silt loam about 4 inches thick. The subsurface layer, to a depth of about 10 inches, is dark yellowish brown silt loam that is mottled in shades of gray. The upper part of the subsoil, to a depth of about 23 inches, is yellowish brown silt loam that is mottled in shades of gray. The lower part is grayish brown silt loam that has brownish mottles to a depth of about 58 inches. The underlying material is light brownish gray sandy loam mottled in shades of brown to a depth of 70 inches.

Chenneby soil is very strongly acid or strongly acid throughout. Permeability is moderate. The available water capacity is high. Runoff is slow, and the hazard of erosion is slight. During prolonged wet periods in winter and early in the spring, the seasonal high water table fluctuates between depths of 1 foot and 2 1/2 feet.

Included in mapping are small areas of a soil that is somewhat poorly drained. This soil is in a similar position on the flood plain as the Cascilla and Chenneby soils. It has a silt loam surface layer and a subsoil that is brownish silty clay loam in the upper part and grayish silty clay loam in the lower part. Also included are small areas of a poorly drained soil that has a silt loam surface layer and a grayish silty clay loam subsoil. This soil is in drainageways, depressions, and old sloughs on the flood plain. The included soils make up the remaining 24 percent of the map unit.

The soils in this map unit are used as woodland. These soils are poorly suited to cultivated crops and small grains because of frequent flooding.

The Cascilla and Chenneby soils are moderately suited to grasses and legumes for hay or pasture. Concerns in management are proper stocking, controlled grazing, and weed and brush control. In some areas, livestock has to be moved to a higher elevation when flooding is imminent.

Both Cascilla and Chenneby soils are well suited to loblolly pine, sweetgum, water oak, American sycamore, and yellow-poplar. In addition to these trees, Cascilla soils are well suited to cherrybark oak, Nuttall oak, and eastern cottonwood. Frequent flooding is a concern in management and a moderate limitation for the use of equipment on these soils. This limitation can be overcome by logging during the drier periods. Seedling mortality also is a moderate limitation. Plant competition is a moderate limitation on Cascilla soil and a severe limitation on Chenneby soil.

Cascilla soil has severe limitations for urban uses and for septic tank absorption fields because of flooding. Chenneby soil also has severe limitations for these uses because of flooding and wetness. Low strength severely limits use for local roads and streets (fig. 5).

Cascilla and Chenneby soils are in capability subclass IVw. Cascilla soil is in woodland suitability group 1w7, and Chenneby soil is in woodland suitability group 1w8.

Figure 4.—The bank of an old slough in an area of Cascilla-Chenneby association, frequently flooded.

Figure 5.—An oil well access road on Cascilla-Chenneby association, frequently flooded. Heavy timbers are used to strengthen the road to support trucks hauling heavy equipment.

DC—Dorovan-Croatan association, frequently flooded. This map unit consists of nearly level, very poorly drained organic soils and also of organic soils that are underlain by loamy alluvium. The soils in this association formed in well decomposed plant parts. These soils are in wide drainageways and on flood plains. They are in a regular and repeating pattern. These soils are ponded or are subject to frequent flooding for periods of long duration. Areas of these soils are mostly wide and irregular in shape and range from 150 to 300 acres or more. The slope is less than 1 percent.

About 54 percent of the map unit is the very poorly drained Dorovan soil. Typically, the surface layer is a very dark gray muck about 10 inches thick. The next layer, to a depth of 58 inches, is black muck. Beneath that is olive gray loam to a depth of 65 inches.

Dorovan soil is extremely acid in the organic layer and very strongly acid or strongly acid in the underlying material. Permeability is moderate. The available water capacity is very high. Runoff is very slow, and the hazard of erosion is slight. The seasonal high water table is at or above the surface for very long periods.

About 35 percent of the map unit is the very poorly drained Croatan soil. Typically, the surface layer is very dark gray decomposed organic material about 8 inches thick. The next layer is black muck to a depth of 45 inches. To a depth of about 52 inches, it is dark gray loam. Below that is light brownish gray sandy loam to a depth of 70 inches.

Croatan soil is extremely acid in the organic layer and very strongly acid or strongly acid in the underlying material. Permeability is slow to moderately rapid. The available water capacity is high. Runoff is very slow, and the hazard of erosion is slight. The seasonal high water table is at or above the surface during wet periods.

Included in mapping are Bibb and Johnston soils. These mineral soils are in similar positions as the Dorovan and Croatan soils on flood plains and in drainageways, or they are in slightly higher positions. The included soils make up about 11 percent of the map unit.

The soils in this map unit are in an area of swamp hardwoods.

These soils are poorly suited to row crops and small grains and to pasture grasses and legumes because of wetness and flooding.

These soils are poorly suited to production of commercial trees. Baldcypress (fig. 6), sweetbay, and blackgum will grow on these soils, although productivity is low. Croatan soil is poorly suited to loblolly pine, slash pine, water tupelo, and sweetgum because of low productivity, but these trees will grow on this soil. Wetness, low productivity, and poor trafficability are the main limitations in woodland management and in harvesting the tree crop. Seedling mortality is a severe limitation.

Dorovan and Croatan soils have severe limitations for urban uses and for septic tank absorption fields because of wetness and flooding. Low strength limits the use of these soils for local streets and roads.

These Dorovan and Croatan soils are in capability subclass VIIw and in woodland suitability group 4w9.

FaB—Falkner silt loam, 2 to 5 percent slopes. This gently sloping, somewhat poorly drained soil formed in a mantle of silty material underlain by clayey sediment. This soil is on broad ridges on uplands.

Typically, the surface layer is very dark grayish brown silt loam about 5 inches thick. The subsurface layer, to a depth of about 9 inches, is pale brown silt loam. The upper part of the subsoil is yellowish brown silt loam to a depth of about 18 inches. The middle part is silty clay loam mottled in shades of brown, gray, and red to a depth of about 32 inches. The lower part of the subsoil

Figure 6.—Baldcypress in an area of Dorovan-Croatan association, frequently flooded.

is silty clay mottled in shades of brown, red, and gray to a depth of 65 inches.

This Falkner soil is very strongly acid or strongly acid throughout. Permeability is moderately slow in the upper part of the subsoil and slow in the lower part. The available water capacity is high. Runoff is medium, and the the hazard of erosion is moderate. In winter and early in the spring during prolonged wet periods, the water table fluctuates between depths of 1 1/2 and 2 1/2 feet. The surface layer is friable and is easily tilled through a wide range of moisture content. However, it tends to crust and pack after heavy rains.

Included with this soil in mapping are small areas of Benndale, Savannah, and Susquehanna soils. These soils are in similar positions on uplands as Falkner soil. Also included are Bibb soils. These soils are in drainageways and on flood plains.

Most of the acreage of this soil is in pasture or row crops.

This soil is moderately suited to corn, soybeans, and small grains. Returning crop residue to the soil, conservation tillage, crop rotation, contour farming, terraces, and grassed waterways are recommended conservation practices.

This soil is well suited to grasses and legumes for hay or pasture. Good pasture management includes proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to cherrybark oak, sweetgum, loblolly pine, and shortleaf pine. Wetness is a moderate limitation for the use of equipment. This limitation can be partly overcome by logging during drier periods. Plant competition also is a moderate limitation.

This soil has severe limitations for most urban uses because of wetness and because of the high shrink-swell potential in the lower part of the subsoil. Low strength is a severe limitation for local roads and streets. Proper design and careful installation help offset these limitations. The slow permeability in the lower part of the subsoil and wetness are severe limitations for septic tank absorption fields. These limitations can be partially overcome by installing a larger than average drainage field.

This Falkner soil is in capability subclass IIIe and in woodland suitability group 2w8.

FaC—Falkner silt loam, 5 to 8 percent slopes. This sloping, somewhat poorly drained soil formed in a mantle of silty material underlain by clayey sediment. This soil is on hillsides on uplands.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsurface layer, to a depth of about 12 inches, is brown silt loam. The subsoil is yellowish brown silt loam to a depth of about 17 inches; yellowish brown silty clay loam mottled in shades of red and gray to a depth of about 28 inches. The next part is silty clay loam mottled in shades of brown, gray, and red to a depth of about 40 inches. To a depth of about 58 inches, it is silty clay mottled in shades of brown, red, and gray. Below that, it is gray silty clay mottled in shades of brown and olive to a depth of 72 inches.

This Falkner soil is very strongly acid or strongly acid throughout. Permeability is moderately slow in the upper part of the subsoil and slow in the lower part. The available water capacity is high. Runoff is medium to rapid, and the hazard of erosion is severe. In winter and early in the spring during prolonged wet seasons, the water table fluctuates between depths of 1 1/2 and 2 1/2 feet. The surface layer is friable and is easily tilled through a wide range of moisture content. However, it tends to crust and pack after hard rains.

Included with this soil in mapping are small areas of Benndale, Savannah, and Susquehanna soils. These soils are in similar positions on uplands as Falkner soil. Also included are Bibb soils in drainageways and on flood plains.

Most of the acreage of this soil is used for pasture or row crops. A small acreage is in woodland.

This soil is poorly suited to corn, soybeans, and small grains. The hazard of erosion and runoff are increased when cultivated crops are grown. Conservation tillage, terraces, grassed waterways, contour farming, and crop rotations that include grasses and legumes reduce runoff and help control erosion.

This soil is moderately suited to grasses and legumes for hay and pasture. Proper stocking, controlled grazing, and weed and brush control help keep the soil and pasture in good condition.

This soil is well suited to cherrybark oak, sweetgum, loblolly pine, and shortleaf pine. Wetness is a moderate limitation for the use of equipment on this soil. This limitation can be partly overcome by logging during drier periods. Plant competition also is a moderate limitation.

This soil has severe limitations for most urban uses because of wetness. Low strength is a severe limitation for streets and roads. The high shrink-swell potential in the lower part of the subsoil also is a severe limitation. Proper design and careful installation help offset these limitations. The slow permeability in the lower part of the subsoil and wetness are severe limitations for use of this soil for a septic tank absorption field.

This Falkner soil is in capability subclass IVe and in woodland suitability group 2w8.

FB—Falkner-Benndale association, undulating. This map unit consists of nearly level to gently sloping soils. The Falkner soil is somewhat poorly drained. It formed in a mantle of silty material underlain by clayey sediment on upland ridgetops and hillsides. The Benndale soil is well drained. This soil formed in stream deposits or marine deposits in slightly higher positions than Falkner soil on upland ridgetops and on stream terraces. The soils in this association are in large wooded areas. They are in a regular and repeating pattern. The landscape is

dissected by narrow, shallow drainageways. Areas of this map unit range from about 100 to 500 acres. The slope ranges from 0 to 5 percent.

Falkner soil makes up about 48 percent of the map unit. Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer, to a depth of about 8 inches, is yellowish brown silt loam. The subsoil extends to a depth of 62 inches. To a depth of about 24 inches, it is brownish yellow silt loam mottled in shades of red and brown in the upper part and mottled in shades of gray in the lower part. To a depth of about 30 inches, the subsoil is silt loam mottled in shades of brown, red, and gray. Below that, it is silty clay loam grading to silty clay mottled in shades of gray, brown, yellow, and red.

Falkner soil is very strongly acid or strongly acid throughout. Permeability is moderately slow in the upper part of the subsoil and slow in the lower part. The available water capacity is high. Runoff is medium, and the hazard of erosion is slight to moderate. In winter and early in the spring during prolonged wet periods, the water table is at a depth of 1 1/2 to 2 1/2 feet. The surface layer is friable and is easily tilled through a wide range of moisture content. However, it tends to crust and pack after heavy rains.

Benndale soil makes up about 32 percent of the map unit. Typically, the surface layer is dark grayish brown sandy loam about 4 inches thick. The subsurface layer, to a depth of about 8 inches, is brown sandy loam. The subsoil extends to a depth of about 70 inches. To a depth of about 16 inches, it is yellowish brown sandy loam mottled in shades of brown. The next layer is strong brown sandy loam to a depth of about 26 inches. Below that, to a depth of about 52 inches, it is yellowish brown grading to light yellowish brown sandy loam mottled in shades of brown. This part of the subsoil also has grayish mottles between depths of 40 and 52 inches. The lower part of the subsoil is sandy loam mottled in shades of brown, yellow, red, and gray.

Benndale soil is very strongly acid or strongly acid throughout. Permeability is moderate. The available water capacity is moderate. Runoff is slow to medium, and the hazard of erosion is slight. There is no seasonal high water table within a depth of 6 feet. The surface layer is friable and is easily tilled through a wide range of moisture content. However, it tends to crust and pack after heavy rains.

Included in mapping are small areas of Bibb, Prentiss, Savannah, Stough, and Susquehanna soils. Bibb soils are in drainageways and on flood plains. Prentiss soils are on stream terraces. Savannah and Stough soils are on stream terraces and uplands. Susquehanna soils are on uplands. The included soils make up about 20 percent of the map unit.

In most areas, the soils in this map unit are used as woodland.

Falkner soil is moderately suited to corn, soybeans, and small grains. Benndale soil is well suited to these crops. Returning crop residue to the soil, conservation tillage, crop rotation, contour farming, terraces, and grassed waterways are recommended conservation practices.

These Falkner and Benndale soils are well suited to grasses and legumes for hay and pasture. Concerns in management include proper stocking, controlled grazing, and weed and brush control.

The Falkner soil is well suited to cherrybark oak, sweetgum, shortleaf pine, and loblolly pine. Benndale soil is well suited to loblolly pine, slash pine, and longleaf pine. For Falkner soil, woodland management limitations are slight except for plant competition, which is moderate. Poor trafficability on Falkner soil during wet periods is a moderate limitation. This limitation can be partially overcome by logging during drier periods.

Wetness and the high shrink-swell potential in the lower part of the subsoil severely limit the use of Falkner soil for most urban uses. Low strength is a severe limitation for local roads and streets. Proper design and careful installation help overcome these limitations. Wetness and slow permeability in the lower part of the subsoil are severe limitations for septic tank absorption fields in Falkner soil. Benndale soil has slight limitations for urban uses and for septic tank absorption fields.

Falkner soil is in capability subclass IIIe, and Benndale soil is in capability subclass IIe. Falkner soil is in woodland suitability group 2w8, and Benndale soil is in woodland suitability group 2o1.

Gu—Guyton silt loam, frequently flooded. This is a nearly level, poorly drained soil that formed in silty material on flood plains and stream terraces. This soil is subject to brief periods of frequent flooding in winter and during part of the growing season. The slope ranges from 0 to 1 percent.

Typically, the surface layer is grayish brown silt loam mottled in dark grayish brown about 5 inches thick. The subsurface layer, to a depth of about 17 inches, is light brownish gray silt loam mottled in shades of brown. The subsoil extends to a depth of about 62 inches. The upper part of the subsoil is light brownish gray silt loam mottled in shades of brown to a depth of about 24 inches. The next layer is grayish brown silt loam mottled in shades of brown to a depth of about 36 inches. To a depth of 50 inches, it is grayish brown silty clay loam mottled in shades of brown. The lower part of the subsoil is light brownish gray silty clay loam mottled in shades of brown.

Guyton soil ranges from extremely acid to strongly acid throughout except where the surface layer has been limed. Permeability is slow. The available water capacity is high. Runoff is slow, and the hazard of erosion is slight. The water table fluctuates between the surface

and a depth of 1 1/2 feet for long periods during wet seasons.

Included with this soil in mapping are small areas of Bibb and Stough soils. Bibb soils are in drainageways and on flood plains. Stough soils are on upland flats and stream terraces.

In most areas, this Guyton soil is used as woodland or pasture.

This soil is poorly suited to row crops (fig. 7) and small grains because of frequent flooding and wetness.

Wetness and flooding limit the choice of pasture plants and restrict cutting and grazing during periods of wetness. These limitations decrease plant survival. However, this soil is moderately suited to grasses and legumes for pasture or hay. Proper stocking, pasture rotation, timely deferment of grazing, and restricted use during wet periods help keep the pasture and soil in good condition.

This soil is well suited to loblolly pine, slash pine, sweetgum, green ash, southern red oak, and water oak. Seasonal wetness and flooding are the main limitations for woodland management and harvesting of the tree crops. Wetness is a severe limitation for use of equipment on this soil. This limitation can be partially overcome by logging during drier periods. Seedling mortality is a moderate limitation.

Wetness and flooding are severe limitations for most urban uses. Low strength is a severe limitation for local streets and roads. Seasonal wetness, flooding, and slow permeability are severe limitations for septic tank absorption fields.

This Guyton soil is in capability subclass Vw and in woodland suitability group 2w9.

Je—Jena fine sandy loam, frequently flooded. This nearly level, well drained soil formed in loamy sediment on flood plains. This soil is subject to brief periods of frequent flooding in winter and during part of the growing season. The slope ranges from 0 to 2 percent.

Typically, the surface layer is dark grayish brown fine sandy loam about 6 inches thick. The upper part of the subsoil is brown fine sandy loam to a depth of about 13 inches. The lower part of the subsoil, to a depth of about 33 inches, is yellowish brown fine sandy loam that has a few small pockets of uncoated sand grains. To a depth

Figure 7.—Rice growing on Guyton silt loam, frequently flooded.

of 58 inches, the underlying material is yellowish brown loamy fine sand that has common medium pockets of uncoated sand grains. Below that, it is yellowish brown sand to a depth of 70 inches.

This Jena soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate. The available water capacity is moderate. Runoff is slow, and the hazard of erosion is slight. There is no seasonal high water table within a depth of 6 feet.

Included with this soil in mapping are small areas of Cascilla and Nugent soils. These soils are on flood plains.

In most areas, this Jena soil is used as woodland. A small acreage is used as pasture.

Jena soil is poorly suited to row crops and small grains because of frequent flooding.

Frequent flooding limits the choice of pasture plants, restricts cutting or grazing during periods of wetness, and decreases plant survival. However, this soil is moderately suited to grasses and legumes for pasture or hay. Concerns in management include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine, slash pine, American sycamore, sweetgum, water oak, southern red oak, white oak, and eastern cottonwood. Seedling mortality is a moderate limitation on Jena soil. The use of equipment is also a moderate limitation because of flooding. These limitations can be partially overcome by logging during the drier periods.

This soil has severe limitations for urban uses and for septic tank absorption fields because of flooding.

This Jena soil is in capability subclass Vw and in woodland suitability group 1w7.

Jg—Jena-Bigbee complex, frequently flooded. This map unit consists of small areas of nearly level soils on the flood plains of large streams. In these areas are many sand bars; narrow, meandering sloughs; and old stream runs. Flooding generally occurs on these soils for long periods several times each year, usually in the winter and in the spring during part of the growing season. Jena soil is well drained. It formed in loamy sediment. Bigbee soil is excessively drained. It formed in sandy material. These soils are so intermingled that it was not practical to map them separately at the scale selected for mapping. Areas of this map unit range from 20 to 200 acres and are mostly long and narrow. The slope ranges from 0 to 2 percent.

Jena soil makes up about 47 percent of the map unit. Typically, the surface layer is brown fine sandy loam about 4 inches thick. The upper part of the subsoil is yellowish brown fine sandy loam to a depth of about 12 inches. To a depth of about 35 inches, it is strong brown grading to yellowish brown fine sandy loam. The underlying material, to a depth of about 58 inches, is light yellowish brown loamy sand mottled in shades of brown. Below that, it is pale brown loamy fine sand to a depth of 70 inches.

Jena soil is very strongly acid or strongly acid throughout. Permeability is moderate. The available water capacity is moderate. Runoff is slow, and the hazard of erosion is slight. There is no seasonal high water table within a depth of 6 feet.

Bigbee soil makes up about 37 percent of the map unit. Typically, the surface layer is brown loamy fine sand about 6 inches thick. The underlying material extends to a depth of 70 inches. The upper part is yellowish brown loamy sand to a depth of about 14 inches. To a depth of about 32 inches, it is brownish yellow loamy sand. Below that, it is light yellowish brown loamy sand to a depth of about 40 inches. The lower part is sand mottled in shades of brown.

Bigbee soil is very strongly acid or strongly acid throughout. Permeability is rapid. The available water capacity is low. Runoff is slow, and the hazard of erosion is slight. During wet periods in winter and early in the spring, the water table fluctuates between depths of 3 1/2 and 6 feet.

Included in mapping are Bibb and Nugent soils. Bibb soils are in old drainageways and on flood plains. Nugent soils are in similar positions on flood plains as the Jena and Bigbee soils. The included soils make up about 16 percent of the map unit.

In most areas, these soils are used as woodland. A small acreage is in pasture.

These soils are poorly suited to row crops and small grains because of frequent flooding.

Frequent flooding limits the choice of pasture plants, restricts cutting or grazing during periods of wetness, and decreases plant survival. Jena soil is moderately suited to grasses and legumes for hay and pasture, and Bigbee soil is poorly suited to these uses. Proper stocking, controlled grazing, and weed and brush control are concerns in management.

Jena soil is well suited to loblolly pine, slash pine, sweetgum, water oak, southern red oak, white oak, eastern cottonwood, and American sycamore. Bigbee soil is well suited to loblolly pine. Flooding is the main limitation for woodland management and for harvesting the tree crops. This limitation can be partially overcome by logging during drier periods. Seedling mortality is a moderate limitation on Jena and Bigbee soils.

Jena and Bigbee soils have severe limitations for urban uses and for septic tank absorption fields because of flooding.

Jena and Bigbee soils are in capability subclass Vw. Jena soil is in woodland suitability group 1w7, and Bigbee soil is in woodland suitability group 2s5.

JN—Jena-Nugent association, frequently flooded. This map unit consists of nearly level soils on the flood plains of the Pearl River. They are in a regular and repeating pattern. In these areas are many sand bars;

oxbow lakes; narrow, meandering sloughs; and old river runs. Jena soil formed in loamy sediment. Nugent soil formed in stratified sandy sediment. The soils in this association are subject to frequent flooding for long periods several times each year, generally, in winter and during part of the growing period. Areas of this map unit range from about 160 to 900 acres or more. The slope ranges from 0 to 2 percent.

Jena soil is well drained. It is in higher positions on the flood plain. This soil supports a dense, mixed forest of spruce pines and bottom land hardwoods. Nugent soil is excessively drained. It is on sand bars and levees near the river. This soil supports some hardwoods, but in some small areas, it is almost devoid of vegetation.

Jena soil makes up about 41 percent of the map unit. Typically, the surface layer is dark brown silt loam about 3 inches thick. The subsoil extends to a depth of about 42 inches. The upper part of the subsoil is yellowish brown silt loam to a depth of about 8 inches. The lower part is yellowish brown and light yellowish brown fine sandy loam mottled in shades of brown. The underlying material is light yellowish and very pale brown loamy sand mottled in shades of brown to a depth of 76 inches.

Jena soil is very strongly acid or strongly acid throughout. Permeability is moderate. The available water capacity is moderate. Runoff is slow, and the hazard of erosion is slight. There is no seasonal high water table within a depth of 6 feet.

Nugent soil makes up about 32 percent of the map unit. Typically, the surface layer is pale brown loamy sand about 5 inches thick. Below that, to a depth of 76 inches, is stratified brownish sand, loamy sand, and fine sandy loam that contain thin layers of silt loam.

Nugent soil is very strongly acid or strongly acid throughout. Permeability is moderately rapid. The available water capacity is low. Runoff is slow, and the hazard of erosion is slight. During wet periods in winter and early in the spring, the water table fluctuates between depths of 3 1/2 and 6 feet.

Included in mapping are small areas of Cascilla and Chenneby soils. These soils are in similar positions on flood plains as Jena and Nugent soils. Also included are some poorly drained soils that have a silt loam surface layer and a grayish silty clay loam subsoil. These soils are in sloughs and drainageways. Sand and gravel pits are also included. The included soils make up about 27 percent of the map unit.

Most of the acreage of these soils are in woodland. A small acreage is openland where sand and gravel have been mined.

These soils are poorly suited to row crops and small grains because of frequent flooding.

Frequent flooding limits the choice of pasture plants, restricts cutting or grazing during periods of wetness, and decreases plant survival. However, Jena soils are moderately suited to grasses and legumes for hay and pasture, and Nugent soils are poorly suited to these uses. Concerns in management include proper stocking, controlled grazing, and weed and brush control. In some areas, livestock has to be moved to higher elevation when flooding is imminent.

Jena soil is well suited to loblolly pine, sweetgum, water oak, southern red oak, white oak (fig. 8), slash pine, eastern cottonwood, and American sycamore. Nugent soil is well suited to loblolly pine, slash pine, sweetgum, water oak, willow oak, and yellow-poplar. Flooding is the main limitation for woodland management and for harvesting the tree crops. This limitation can be partially overcome by logging during drier periods. Seedling mortality is a moderate limitation on Jena and Nugent soils.

Jena and Nugent soils have severe limitations for urban uses and for septic tank absorption fields because they are subject to frequent flooding. Summer homes and cottages near the Pearl River should be built above normal flood level.

Jena and Nugent soils are in capability subclass Vw. Jena soil is in woodland suitability group 1w7, and Nugent soil is in woodland suitability group 2s5.

Jt—Johnston-Croatan complex, frequently flooded. This map unit consists of small areas of nearly level, very poorly drained soils in narrow drainageways and on flood plains. Johnston soil formed in loamy stratified sediment, and Croatan soil formed in decomposed organic material underlain by loamy alluvium. The soils in these areas are so intermingled that it was not practical to map them separately at the scale selected for mapping. These soils are ponded or are subject to frequent flooding for long periods throughout the year. Areas of these soils are mostly long and narrow and range from about 10 to 100 acres. The slope is less than 1 percent.

Johnston soil makes up about 5l percent of the map unit. Typically, the surface layer is very dark gray mucky loam about 24 inches thick. The next layer, to a depth of about 32 inches, is dark gray loam. The underlying material is light brownish gray sandy loam to a depth of about 50 inches. Below that, it is gray loamy sand to a depth of 70 inches.

Johnston soil is very strongly acid or strongly acid throughout. Permeability is moderately rapid in the surface layer and rapid in the underlying layers. The available water capacity is moderate to high. Runoff is very slow, and the hazard of erosion is slight. The seasonal high water table is at or above the surface for very long periods.

Croatan soil makes up about 39 percent of the map unit. Typically, the surface layer is very dark gray muck about 7 inches thick. To a depth of about 36 inches, it is black muck. Below that, the underlying material is gray loam to a depth of about 54 inches and light brownish gray loam to a depth of 65 inches.

Figure 8.—A roadway through a stand of hardwood timber on Jena-Nugent association, frequently flooded.

Croatan soil is extremely acid in the organic layer and very strongly acid or strongly acid in the underlying material. Permeability is slow to moderately rapid. The available water capacity is very high. Runoff is very slow, and the hazard of erosion is slight. The seasonal high water table is near the surface for very long periods.

Included in mapping are small areas of Bibb and Dorovan soils. Bibb soils are mineral soils. They are on flood plains and in drainageways. Dorovan soils are on flood plains. The included soils make up about 10 percent of the map unit.

The soils in this map unit are in an area of swamp hardwoods.

These soils are poorly suited to row crops and small grains and to pasture grasses and legumes because of wetness and frequent flooding.

Johnston soil is well suited to baldcypress, swamp tupelo, water oak, loblolly pine, sweetgum, and water tupelo. Croatan soil is poorly suited to water tupelo, baldcypress, and sweetgum, but these trees will grow on this soil. Wetness and poor trafficability are the main limitations for woodland management and for harvesting the tree crops. Seedling mortality is a severe limitation for Johnston and Croatan soils.

These Johnston and Croatan soils have severe limitations for urban uses and for septic tank absorption fields because of flooding, ponding, and wetness. In addition, these soils have severe limitations for use for local streets and roads because of low strength.

Johnston and Croatan soils are in capability subclass VIIw. Johnston soil is in woodland suitability group 1w9, and Croatan soil is in woodland suitability group 4w9.

LaA—Latonia sandy loam, 0 to 2 percent slopes. This nearly level, well drained soil formed in loamy alluvium. This soil is on stream terraces.

Typically, the surface layer is dark grayish brown sandy loam about 8 inches thick. The subsoil extends to a depth of 37 inches. The upper part of the subsoil, to a depth of about 14 inches, is yellowish brown sandy loam; the lower part is yellowish brown sandy loam mottled in shades of brown. The underlying material, to a depth of

about 62 inches, is brownish yellow sand that has brownish mottles. Below that, it is very pale brown sand that has yellowish mottles to a depth of 80 inches.

This Latonia soil is very strongly acid or strongly acid throughout. Permeability is moderately rapid. The available water capacity is moderate. Runoff is slow, and the hazard of erosion is slight. There is no seasonal high water table within a depth of 6 feet. The surface layer is friable and is easily tilled through a wide range of moisture content.

Included with this soil in mapping are small areas of Bassfield, Cahaba, and Bibb soils. Bassfield and Cahaba soils are on stream terraces. Bibb soils are in drainageways and on flood plains.

Almost the entire acreage of this soil is in row crops or pasture.

Latonia soil is well suited to corn, soybeans, and small grains. It is somewhat droughty. Returning crop residue to the soil, conservation tillage, crop rotation, and aligning crop rows to remove excess surface water are recommended conservation practices.

This soil is well suited to grasses and legumes for hay and pasture. Good pasture management includes proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine (fig. 9), longleaf pine, and slash pine. There are few significant limitations to woodland management.

This soil has slight limitations for most urban uses. The limitation of this soil for septic tank absorption fields is severe because the sandy substratum is a poor filter for the effluent.

This Latonia soil is in capability subclass IIs and in woodland suitability group 2o1.

LuA—Lucedale loam, 0 to 2 percent slopes. This nearly level, well drained soil formed in loamy marine sediment. This soil is on broad uplands.

Typically, the surface layer is dark brown loam about 6 inches thick. The subsoil extends to a depth of about 60

Figure 9.—Loblolly pines planted on Latonia sandy loam, 0 to 2 percent slopes.

inches or more. The upper part of the subsoil is dark red loam to a depth of about 32 inches, and the lower part is dark red sandy clay loam.

This slightly eroded soil has a few rills. In some areas, there is evidence of accelerated erosion on the surface layer but not enough to greatly modify the thickness or the character of the original plow layer.

This Lucedale soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate. The available water capacity is high. Runoff is slow, and the hazard of erosion is slight. There is no seasonal high water table within a depth of 6 feet. The surface layer is friable and is easily tilled through a wide range of moisture content. However, it tends to crust and pack after heavy rains.

Included with this soil in mapping are small areas of Ruston soils on uplands. Also included are some moderately well drained soils on uplands. These soils have a reddish loam subsoil and a fragipan.

In most areas, this Lucedale soil is used as cropland or pasture. The remainder is in woodland.

This soil is well suited to corn, soybeans, and small grains. Returning crop residue to the soil is a recommended conservation practice. Arrangement of row crops is needed in some places to remove excess surface water.

This soil is well suited to grasses and legumes for hay and pasture. Proper stocking, controlled grazing, and weed and brush control help keep the soil and pasture in good condition.

This soil is well suited to slash pine, longleaf pine, and loblolly pine. Woodland management limitations are slight.

This soil has slight limitations for urban uses and for septic tank absorption fields.

The Lucedale soil is in capability subclass I and in woodland suitability group 2o1.

MnB—McLaurin fine sandy loam, 2 to 5 percent slopes. This gently sloping, well drained soil formed in loamy marine sediment. This soil is on ridgetops on uplands.

Typically, the surface layer is brown fine sandy loam about 4 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 8 inches. The subsoil extends to a depth of 62 inches or more. The upper part of the subsoil is red loam to a depth of 23 inches. The next layer, to a depth of about 32 inches, is yellowish red sandy loam. The next layer, to a depth of about 42 inches, is strong brown loamy sand that has pockets of light yellowish brown uncoated sand grains. The lower part of the subsoil is red loam.

This slightly eroded soil has a few rills. In some areas, there is evidence of accelerated erosion on the surface layer but not enough to greatly modify the thickness or the character of the original plow layer.

This McLaurin soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate. The available water capacity is moderate. Runoff is medium to slow, and the hazard of erosion is slight. There is no seasonal high water table within a depth of 6 feet. The surface layer is friable and is easily tilled through a wide range of moisture content.

Included with this soil in mapping are small areas of Benndale and Ruston soils. These soils are in upland positions on the landscape.

In most areas, this McLaurin soil is used as cropland or pasture. The remainder is in woodland.

This soil is well suited to corn, soybeans, and small grains. It is somewhat droughty. Crop yields decline during long dry periods. Fertilizer is leached from this soil faster than in soils that have a slower permeability. Conservation tillage, returning crop residue to the soil, contour farming, terraces, and grassed waterways are recommended conservation practices.

This soil is well suited to grasses and legumes for hay and pasture. Proper stocking, controlled grazing, and weed and brush control reduce runoff, help control erosion, and help keep the soil and pasture in good condition.

This soil is well suited to loblolly pine, longleaf pine, and slash pine. Woodland management limitations are slight.

The limitations for most urban uses and for septic tank absorption fields are slight. Plans for homesites should provide for the preservation of trees.

This McLaurin soil is in capability subclass IIe and in woodland suitability group 2o1.

MnC—McLaurin fine sandy loam, 5 to 8 percent slopes. This sloping, well drained soil formed in loamy marine sediment. This soil is on ridges and hillsides on uplands.

Typically, the surface layer is very dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer, to a depth of about 10 inches, is light yellowish brown sandy loam. The subsoil extends to a depth of about 65 inches. The upper part of the subsoil is yellowish red loam to a depth of about 28 inches. The next layer, to a depth of about 40 inches, is yellowish red sandy loam mottled in shades of brown. The lower part is yellowish red loam mottled in shades of brown and red.

This slightly eroded soil has a few rills. In some areas, there is evidence of accelerated erosion on the surface layer but not enough to greatly modify the thickness or the character of the original plow layer.

This McLaurin soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate. The available water capacity is moderate. Runoff is medium, and the hazard of erosion is moderate. There is no seasonal high water

table within a depth of 6 feet. The surface layer is friable and is easily tilled through a wide range of moisture content.

Included with this soil in mapping are small areas of Lucy and Ruston soils. These soils are on uplands.

In most areas, this McLaurin soil is used as cropland or pasture. A small acreage is used as woodland.

It is moderately suited to corn, soybeans, and small grains. When cultivated crops are grown, erosion control practices, such as returning crop residue to the soil, crop rotation, conservation tillage, contour farming, contour stripcropping, grassed waterways, and terraces should be used.

This soil is moderately suited to grasses and legumes for hay and pasture. Proper stocking, controlled grazing, and weed and brush control reduce runoff, help control erosion, and help keep the soil and pasture in good condition.

This soil is well suited to loblolly pine, longleaf pine, and slash pine. Woodland management limitations are slight.

This soil has slight limitations for most urban uses. The limitations for small commercial buildings are moderate because of steepness of slope. The limitation of this soil for septic tank absorption fields is slight. Plans for homesites should provide for the preservation of trees.

This McLaurin soil is in capability subclass IIIe and in woodland suitability group 2o1.

Ng—Nugent sand, frequently flooded. This nearly level, excessively drained soil formed in stratified sandy sediment on flood plains. This soil is subject to long periods of frequent flooding in winter and during part of the growing season. The slope ranges from 0 to 2 percent.

Typically, the surface layer is pale brown sand about 2 inches thick. Below that is stratified loamy sand, sand, and fine sandy loam in shades of brown to a depth of 62 inches.

This Nugent soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderately rapid. The available water capacity is low. Runoff is slow, and the hazard of erosion is slight. During wet periods in winter and early in the spring, the water table fluctuates between depths of 3 1/2 and 6 feet.

Included with this soil in mapping are small areas of Jena soils. These soils are on flood plains.

In most areas, this Nugent soil is almost barren and devoid of vegetation except for sparse low-growing water-tolerant plants. This soil is poorly suited to cultivated crops and small grains because of frequent flooding. It is poorly suited to pasture grasses and legumes because of limited productivity.

This soil is well suited to loblolly pine, slash pine, sweetgum, water oak, willow oak, and yellow-poplar. Poor trafficability and seedling mortality are moderate limitations because of the sandy soil.

This soil has severe limitations for urban uses and for septic tank absorption fields because of flooding.

This Nugent soil is in capability subclass Vw and in woodland suitability group 2s5.

PS—Petal-Susquehanna association, rolling. This map unit consists of gently undulating to steep soils in large wooded areas on uplands. These soils are in a regular and repeating pattern. The landscape is dominantly broad, rolling hilltops and short, steep hillsides that border narrow drainageways. Areas of this map unit range from 120 to 600 acres or more. The slope ranges from 2 to 20 percent.

Petal soil is moderately well drained. It formed in loamy and clayey marine sediment on rolling to steep hillsides that have a slope gradient of 8 to 20 percent. Susquehanna soil is somewhat poorly drained. It formed in clayey marine sediment on gently sloping to strongly sloping ridgetops and hillsides that have a slope gradient of 2 to 10 percent.

Petal soil makes up about 36 percent of the map unit. Typically, the surface layer is dark grayish brown sandy loam about 4 inches thick. The subsurface layer is yellowish brown sandy loam to a depth of about 10 inches. The subsoil extends to a depth of about 65 inches. The upper part of the subsoil, to a depth of about 16 inches, is red clay loam that has brownish mottles. The next layer is red clay loam mottled in shades of brown and gray to a depth of about 25 inches. The next layer, to a depth of about 40 inches, is clay loam mottled in shades of red, brown, yellow, and gray. Below that, to a depth of about 54 inches, it is clay loam mottled in shades of gray, brown, yellow and red. The lower part of the subsoil is light gray silty clay loam mottled in shades of brown.

Petal soil is very strongly acid or strongly acid throughout. Permeability is moderately slow in the upper part of the subsoil and slow in the lower part. The available water capacity is high. Runoff is rapid, and the the hazard of erosion is severe. During prolonged wet periods in winter and early in the spring, the water table fluctuates between depths of 2 1/2 and 3 1/2 feet.

Susquehanna soil makes up about 26 percent of the map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer, to a depth of about 9 inches, is yellowish brown fine sandy loam. The subsoil extends to a depth of about 62 inches. The upper part of the subsoil, to a depth of about 16 inches, is red clay. The next layer, to a depth of about 28 inches, is red clay mottled in shades of gray. Below that, to a depth of about 52 inches, is clay mottled in shades of gray, red, and yellow. The lower part of the subsoil is light gray clay mottled in shades of red, brown, and olive.

Susquehanna soil is very strongly acid or strongly acid throughout. Permeability is very slow. The available water capacity is high. Runoff is rapid, and the hazard of erosion is severe. The shrink-swell potential is high. There is no seasonal high water table within a depth of 6 feet.

Included in mapping are small areas of Benndale, Bibb, Falkner, Lucy, Ruston, and Smithdale soils. Benndale soils are on uplands and stream terraces. Bibb soils are in drainageways and on flood plains. Falkner, Lucy, Ruston, and Smithdale soils are on uplands. The included soils make up about 38 percent of the map unit.

The soils in this map unit mostly are used as woodland.

These soils are poorly suited to row crops and small grains because of steepness of slopes and the hazard of erosion.

These soils are moderately suited to grasses and legumes for hay and pasture because of limited productivity. Concerns in management include proper stocking, controlled grazing, and weed and brush control.

The Petal soil is well suited to slash pine, longleaf pine, shortleaf pine, loblolly pine, and cherrybark oak. The woodland management limitations on Petal soil are slight. Susquehanna soil is moderately suited to slash, longleaf, shortleaf, and loblolly pines. Plant competition and poor trafficability during wet periods are moderate limitations for use of Susquehanna soil as woodland. The trafficability limitation can be partially overcome by logging during drier periods.

Petal and Susquehanna soils have a severe limitation for urban uses because of the high shrink-swell potential of the subsoil. Steepness of slope is a severe limitation for use of these soils for small commercial buildings. Low strength also is a limitation for use of Susquehanna soil for local roads and streets. Wetness and the moderately slow permeability of the subsoil severely limit the use of Petal soil for septic tank absorption fields, and the very slow permeability of the subsoil severely limits the use of Susquehanna soil for septic tank absorption fields. These limitations can be partially overcome by installing a larger than average drainage field.

Petal and Susquehanna soils are in capability subclass VIe. Petal soil is in woodland suitability group 2o7, and Susquehanna soil is in woodland suitability group 3c2.

Pt—Pits-Udorthents complex. This complex consists of gravel pits, sand pits, and borrow pits. These pits are open excavations from which gravel, sand, and other fill material have been removed. Some areas consist mainly of sandy tailings from hydraulic dredging of the river channel. Areas range from 2 to 75 acres.

Sand pits are areas from which sand has been removed. Borrow pits are areas from which soil and underlying material have been removed for use in construction of roads or as fill material.

Pits require major reclamation before they can be used for cropland or pasture. Pine trees can help protect the soil against erosion; but, because of the low fertility of the soil in the exposed substratum, these trees grow slowly.

Udorthents consists mainly of overburden that was removed from the surface as the pit was dug and from the accumulation of eroded sediment from the pit walls and floors. The potential of this soil for grass and for trees is low.

This map unit has not been assigned to a capability subclass or to a woodland suitability group.

PxA—Prentiss fine sandy loam, 0 to 2 percent slopes. This moderately well drained soil formed in loamy material on stream terraces. This soil has a fragipan.

Typically, the surface layer is dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer is brown fine sandy loam that has brownish mottles to a depth of about 8 inches. The subsoil extends to a depth of 65 inches. The upper part of the subsoil, to a depth of about 19 inches, is yellowish brown sandy loam mottled in shades of brown. The middle part is brownish yellow loam mottled in shades of brown to a depth of about 25 inches. The lower part is a firm and compact and brittle loam fragipan that is mottled in shades of brown, gray, yellow, and red.

This slightly eroded soil has a few rills. In some areas, there is evidence of accelerated erosion on the surface layer but not enough to greatly modify the thickness or the character of the original plow layer.

This Prentiss soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow through the fragipan. The available water capacity is moderate. Runoff is slow, and the hazard of erosion is slight. A perched water table is above the fragipan at a depth of 2 to 2 1/2 feet in wet periods. The fragipan restricts the rooting depth and limits the amount of water available to the plants. The surface layer is friable and is easily tilled through a wide range of moisture content.

Included with this soil in mapping are small areas of Latonia and Stough soils. Latonia soils are on stream terraces. Stough soils are on upland flats and stream terraces.

In most areas, Prentiss soil is used as cropland or pasture. A small acreage is in woodland.

This soil is well suited to corn, soybeans, and small grains. Row alignment, grassed waterways, and surface field ditches are needed to remove excess surface water. Conservation tillage and returning crop residue to the soil improve fertility and help to maintain good tilth.

This soil is well suited to grasses and legumes for pasture or hay. Proper stocking, pasture rotation, timely

deferment of grazing, and weed and brush control help keep the pasture and soil in good condition.

This soil is well suited to loblolly pine, shortleaf pine, slash pine, sweetgum, white oak, and cherrybark oak. Woodland management limitations are slight.

This soil has moderate limitations for most urban uses. Seasonal wetness is the major limitation. The moderately slow permeability in the fragipan and wetness are severe limitations for septic tank absorption fields. These limitations can be partially overcome by installing a larger than average drainage field. Plans for homesites should provide for the preservation of trees.

This Prentiss soil is in capability subclass IIw and in woodland suitability group 2o7.

RuB—Ruston sandy loam, 2 to 5 percent slopes. This gently sloping, well drained soil formed in loamy marine sediment. This soil is on ridgetops on uplands.

Typically, the surface layer is dark yellowish brown sandy loam about 6 inches thick. The upper part of the subsoil, to a depth of about 29 inches, is red sandy clay loam. Below that, to a depth of about 43 inches, is yellowish red fine sandy loam that has light yellowish brown mottles. The lower part of the subsoil is red sandy clay loam to a depth of 62 inches.

This Ruston soil is very stongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate. The available water capacity is moderate. Runoff is slow to medium, and the hazard of erosion is moderate. There is no seasonal high water table within a depth of 6 feet. The surface layer is friable and is easily tilled through a wide range of moisture content.

Included with this soil in mapping are small areas of McLaurin and Savannah soils. McLaurin soils are on uplands. Savannah soils are in similar positions on the landscape as the Ruston soil.

In most areas, this soil is in row crops or pasture (fig. 10). A small acreage is used as woodland.

This soil is well suited to corn, soybeans, and small grains. Returning crop residue to the soil, crop rotation, contour farming, terraces, grassed waterways, and reducing tillage operations are recommended conservation practices.

This soil is well suited to grasses and legumes for hay or pasture. Good pasture management includes proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine, longleaf pine, and slash pine. The woodland management limitations are slight.

This soil has slight limitations for urban uses and for septic tank absorption fields. Low strength is a moderate limitation for local roads and streets.

This Ruston soil is in capability subclass IIe and in woodland suitability group 2o1.

RuC—Ruston sandy loam, 5 to 8 percent slopes. This well drained, sloping soil formed in loamy marine sediment. This soil is on ridgetops and hillsides on uplands.

Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsurface layer, to a depth of about 10 inches, is yellowish brown sandy loam mottled in shades of brown and red. The subsoil extends to a depth of about 70 inches. The upper part of the subsoil is yellowish red sandy clay loam mottled in shades of brown to a depth of about 14 inches. The next layer is red sandy clay loam to a depth of about 25 inches. Below that, it is yellowish red sandy loam mottled in shades of brown to a depth of about 40 inches. The lower part is red sandy clay loam.

This slightly eroded soil has a few rills. In some areas, there is evidence of accelerated erosion on the surface layer but not enough to greatly modify the thickness or the character of the original plow layer.

This Ruston soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate. The available water capacity is moderate. Runoff is medium, and the hazard of erosion is moderate. There is no seasonal high water table within a depth of 6 feet. The surface layer is friable and is easily tilled through a wide range of moisture content.

Included with this soil in mapping are small areas of McLaurin and Savannah soils. McLaurin soils are on uplands. Savannah soils are in similar positions on the landscape as the Ruston soil.

Most of the acreage of this Ruston soil is used for pasture or row crop. A small acreage is in woodland.

This soil is moderately suited to corn, soybeans, and small grains. Contour farming, conservation tillage, terraces, grassed waterways, returning crop residue to the soil, contour stripcropping, and rotation systems that include grasses and legumes reduce runoff and help control erosion.

This soil is well suited to grasses and legumes for hay or pasture. Proper stocking, controlled grazing, and weed and brush control help keep the soil and pasture in good condition.

This soil is well suited to longleaf pine, loblolly pine, and slash pine. The limitations are slight.

This soil has slight limitations for most urban uses. Steepness of slope is a moderate limitation for small commercial buildings. Low strength is a moderate limitation for local roads and streets. The limitation for septic tank absorption fields is slight.

This Ruston soil is in capability subclass IIIe and in woodland suitability group 2o1.

SaF—Saffell gravelly sandy loam, 8 to 40 percent slopes. This strongly sloping to steep, well drained soil formed in loamy and gravelly sediment. This soil is on hillsides on uplands.

Figure 10.—Pasture on Ruston sandy loam, 2 to 5 percent slopes.

Typically, the surface layer is dark grayish brown gravelly sandy loam about 5 inches thick. The subsurface layer is yellowish brown gravelly sandy loam to a depth of about 11 inches. The subsoil extends to a depth of 48 inches or more. The upper part of the subsoil is red very gravelly sandy clay loam to a depth of about 24 inches. The lower part is yellowish red very gravelly fine sandy loam that has red mottles. The underlying material is yellowish red gravelly loamy sand to a depth of 80 inches.

This slightly eroded soil has a few rills. In some areas, there is evidence of accelerated erosion on the surface layer but not enough to greatly modify the thickness or the character of the original plow layer.

This Saffell soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate. The available water capacity is low. Runoff is rapid, and the hazard of erosion is severe. There is no seasonal high water table within a depth of 6 feet.

Included with this soil in mapping are small areas of Lucy and Smithdale soils on hilly uplands.

In most areas, Saffell soil is used as woodland.

This soil is poorly suited to cultivated crops and small grains because of gravelly texture, steepness of slope, rapid runoff, hazard of erosion, and low productivity. This soil should be planted to trees or used for pasture.

Because of the low productivity of this soil, it is poorly suited to grasses and legumes for hay or pasture. However, the use of the soil for grasses and legumes effectively controls erosion. To facilitate mowing and other cultural practices, gullies should be smoothed and shaped. Proper stocking, controlled grazing, and weed and brush control reduce runoff and help keep the soil and pasture in good condition.

This Saffell soil is poorly suited to loblolly pine and shortleaf pine and to hardwoods because of low

productivity. However, pines are the recommended trees to plant on this soil. Steepness of slope is a moderate limitation for woodland management.

This soil has severe limitations for urban uses and for septic tank absorption fields because of steepness of slope. This limitation can be partially overcome by installing the drainage field on the contour.

This Saffell soil is in capability subclass VIIe and in woodland suitability group 4f2.

ShA—Savannah fine sandy loam, 0 to 2 percent slopes. This nearly level, moderately well drained soil formed in loamy material on stream terraces and uplands. This soil has a fragipan.

Typically, the surface layer is dark brown fine sandy loam about 6 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 12 inches. The subsoil extends to a depth of 70 inches. The upper part of the subsoil, to a depth of about 18 inches, is yellowish brown loam that has strong brown mottles. The next layer, to a depth of about 50 inches, is loam mottled in shades of brown, gray, red, and yellow; it is a firm and compact and brittle fragipan. The lower part is sandy clay loam mottled in shades of brown, gray, red, and yellow.

This slightly eroded soil has a few rills. In some areas, there is evidence of accelerated erosion on the surface layer but not enough to greatly modify the thickness or the character of the original plow layer.

This Savannah soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow through the fragipan. The available water capacity is moderate. Runoff is slow, and the hazard of erosion is slight. During prolonged wet periods in winter and early in the spring, a perched water table is above the fragipan at a depth of 1 1/2 to 3 feet. The fragipan restricts the rooting depth and limits the amount of water available to the plants. The surface layer is friable and is easily tilled through a wide range of moisture content.

Included with this soil in mapping are small areas of Prentiss and Stough soils. Prentiss soils are on stream terraces. Stough soils are on uplands and stream terraces.

In most areas, Savannah soil is used as cropland or pasture. A small acreage is in woodland.

This soil is well suited to corn, soybeans, and small grains. Row alignment, grassed waterways, and surface field ditches are needed to remove excess surface water. Conservation tillage and returning crop residue to the soil improve soil fertility and help maintain good tilth.

This soil is well suited to grasses and legumes for pasture or hay. Proper stocking, pasture rotation, timely deferment of grazing, and weed and brush control help to keep the pasture and soil in good condition.

This soil is well suited to loblolly pine, longleaf pine, shortleaf pine, slash pine, sweetgum, American sycamore, and yellow-poplar. Woodland management limitations are slight except for plant competition, which is moderate.

This soil has moderate limitations for most urban uses. Seasonal wetness is the major limitation. Proper design and careful installation help overcome this wetness limitation. The moderately slow permeability in the fragipan and wetness are severe limitations for septic tank absorption fields. These limitations can be partially overcome by installing a larger than average drainage field. Plans for homesites should provide for the preservation of trees.

This Savannah soil is in capability subclass IIw and in woodland suitability group 2o7.

ShB—Savannah fine sandy loam, 2 to 5 percent slopes. This gently sloping, moderately well drained soil formed in loamy material on stream terraces and uplands. This soil has a fragipan.

Typically, the surface layer is dark grayish brown fine sandy loam about 6 inches thick. The subsurface layer is dark brown fine sandy loam to a depth of about 10 inches. The subsoil extends to a depth of 70 inches. The upper part of the subsoil, to a depth of about 26 inches, is yellowish brown loam that has strong brown mottles. The lower part is sandy loam mottled in shades of brown, gray, red, and yellow; it is a firm and compact and brittle fragipan.

This slightly eroded soil has a few rills. In some areas, there is evidence of accelerated erosion on the surface layer but not enough to greatly modify the thickness or the character of the original plow layer.

This Savannah soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow through the fragipan. The available water capacity is moderate. Runoff is medium or slow, and the hazard of erosion is slight or moderate. During prolonged wet periods in winter and early in the spring, a perched water table is above the fragipan at a depth of 1 1/2 to 3 feet. The fragipan restricts the rooting depth and limits the amount of water available to the plants. The surface layer is friable and is easily tilled through a wide range of moisture content.

Included with this soil in mapping are small areas of Prentiss and Stough soils. Prentiss soils are on stream terraces, and Stough soils are on upland flats and stream terraces.

In most areas, Savannah soil is used as pasture or cropland. A small acreage is used as woodland.

This soil is well suited to corn, soybeans, and small grains. Conservation tillage, crop rotation, contour farming, terraces, and grassed waterways reduce runoff and help control erosion. Returning crop residue to the soil improves fertility and helps maintain good tilth.

This soil is well suited to grasses and legumes for pasture or hay (fig. 11). Proper stocking, pasture rotation, timely deferment of grazing, and weed and brush control help keep the pasture and soil in good condition.

This soil is well suited to loblolly pine, longleaf pine, slash pine, sweetgum, American sycamore, and yellow-poplar. Woodland management limitations are slight except for plant competition, which is moderate.

This soil has moderate limitations for most urban uses. Seasonal wetness is the major limitation. This limitation can be partially overcome by proper design and careful installation. Plans for homesites should provide for the preservation of trees.

The moderately slow permeability in the fragipan and wetness are severe limitations for septic tank absorption fields. These limitations can be partially overcome by installing a larger than average drainage field.

This Savannah soil is in capability subclass IIe and in woodland suitability group 2o7.

ShC—Savannah fine sandy loam, 5 to 8 percent slopes. This sloping, moderately well drained soil formed in loamy material on stream terraces and uplands. This soil has a fragipan.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsurface layer is yellowish brown loam to a depth of about 11 inches. The subsoil extends to a depth of 70 inches. The upper part of the subsoil, to a depth of about 24 inches, is yellowish brown loam that has brownish mottles. The middle part, to a depth of about 50 inches, is sandy loam mottled in shades of brown, gray, and red; it is a firm and compact and brittle fragipan. The lower part is sandy loam that grades to sandy clay loam mottled in shades of brown, yellow, gray, and red.

This slightly eroded soil has a few rills. In some areas, there is evidence of accelerated erosion on the surface layer but not enough to greatly modify the thickness or the character of the original plow layer.

Figure 11.—Bahiagrass hay on Savannah fine sandy loam, 2 to 5 percent slopes.

This Savannah soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow through the fragipan. The available water capacity is moderate. Runoff is medium, and the the hazard of erosion is moderate. During prolonged wet periods in winter and early in the spring, a perched water table is above the fragipan at a depth of 1 1/2 to 3 feet. The fragipan restricts the rooting depth and limits the amount of water available to the plants. The surface layer is friable and is easily tilled through a wide range of moisture content.

Included with this soil in mapping are small areas of Benndale and Prentiss soils. Benndale soils are on uplands and stream terraces. Prentiss soils are on stream terraces.

In most areas, Savannah soil is used as pasture or cropland. A small acreage is in woodland.

This soil is moderately suited to corn, soybeans, and small grains. Conservation tillage, contour farming, contour stripcropping, crop rotation, terraces, and grassed waterways reduce runoff and help control erosion. Returning crop residue to the soil improves fertility and helps maintain good tilth.

This soil is well suited to grasses and legumes for pasture or hay. Proper stocking, pasture rotation, timely deferment of grazing, and weed and brush control help keep the pasture and soil in good condition.

This soil is well suited to loblolly pine, longleaf pine, slash pine, sweetgum, American sycamore, and yellow-poplar. Woodland management limitations are slight except plant competition, which is moderate.

This soil has moderate limitations for most urban uses. Seasonal wetness and steepness of slope for small commercial buildings are the major limitations. These limitations can be partially overcome by proper design and careful installation. The moderately slow permeability in the fragipan and wetness are severe limitations for septic tank absorption fields. These limitations can be partially overcome by installing a larger than average drainage field.

This Savannah soil is in capability subclass IIIe and in woodland suitability group 2o7.

SkE—Smithdale sandy loam, 8 to 15 percent slopes. This strongly sloping to moderately steep, well drained soil formed in loamy sediment. This soil is on hillsides on uplands.

Typically, the surface layer is dark grayish brown sandy loam about 7 inches thick. The subsurface layer, to a depth of about 12 inches, is yellowish brown sandy loam mottled in shades of brown. The subsoil extends to a depth of 80 inches or more. The upper part of the subsoil is yellowish red sandy clay loam to a depth of about 18 inches. The next layer is red sandy clay loam to a depth of about 38 inches. Below that, it is red sandy loam to a depth of about 52 inches. The lower part is yellowish red sandy loam that has common coarse pockets of uncoated sand grains.

This Smithdale soil is very strongly acid or strongly acid throughout. Permeability is moderate. The available water capacity is moderate. Runoff is rapid, and the hazard of erosion is severe. There is no seasonal high water table within a depth of 6 feet.

Included with this soil in mapping are small areas of Ruston and Susquehanna soils on uplands.

In most areas, this Smithdale soil is used as woodland. A small acreage is in pasture.

This soil is poorly suited to row crops and small grains because of the hazard of erosion, rapid runoff, and steepness of slope. Permanent vegetation of grasses and legumes or trees should be kept on this soil.

This soil is moderately suited to grasses and legumes for hay and pasture. The use of this soil for hay and pasture also helps control erosion. Concerns in management include proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine, longleaf pine, shortleaf pine, and slash pine. Limitations to woodland management mainly are slight, but plant competition is a moderate limitation.

This soil has moderate limitations for urban uses. Slope is the main concern in management. Steepness of slope is a severe limitation for small commercial buildings. This soil is moderately limited for septic tank absorption fields because of steepness of slope. This limitation can be partially overcome by installing the drainage fields on the contour.

This Smithdale soil is in capability subclass VIe and in woodland suitability group 2o1.

SkF—Smithdale sandy loam, 15 to 35 percent slopes. This moderately steep to steep, well drained soil formed in loamy marine sediment. This soil is on hillsides on uplands.

Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsurface layer is yellowish brown sandy loam to a depth of about 12 inches. The subsoil extends to a depth of about 65 inches. The upper part of the subsoil, to a depth of about 24 inches, is red sandy clay loam. The next layer, to a depth of about 36 inches, is red loam that has strong brown mottles. The lower part of the subsoil is red sandy loam that has strong brown mottles. Below that is red sandy loam that has common coarse pockets of brownish yellow uncoated sand grains to a depth of 84 inches.

This Smithdale soil is very strongly acid or strongly acid throughout. Permeability is moderate. The available water capacity is moderate. Runoff is rapid, and the hazard of erosion is severe. There is no seasonal high water table within a depth of 6 feet.

Included with this soil in mapping are small areas of McLaurin, Petal, and Saffell soils. McLaurin soils are on

upland ridges. Petal and Saffell soils are on upland hillsides.

In most areas, this soil is used as woodland. A small acreage is in pasture.

Smithdale soil is poorly suited to cultivated crops because of steepness of slope, rapid runoff, and the hazard of erosion. It is poorly suited to pasture grasses and legumes because of the low productivity of the soil. Permanent vegetation of grasses and legumes or trees should be kept on this soil. Good pasture management includes proper stocking, controlled grazing, and weed and brush control.

This soil is well suited to loblolly pine, longleaf pine, shortleaf pine, and slash pine. For Smithdale soil, woodland management limitations are slight except for plant competition, which is moderate.

This soil has severe limitations for urban uses and for use as a septic tank absorption field because of the steepness of slope. This limitation can be partially overcome by installing the drainage field on the contour.

This Smithdale soil is in capability subclass VIIe and in woodland suitability group 2o1.

SL—Smithdale-Lucy association, hilly. This map unit consists of gently undulating to steep, well drained soils that formed in loamy marine sediment in large areas on wooded uplands. These soils are in a regular and repeating pattern. The landscape is dominantly hilly and is dissected by many narrow drainageways. Areas of these soils range from about 160 to 900 acres or more. The slope ranges from 5 to 40 percent.

The Smithdale soil is mostly on sloping to steep hillsides. The slope ranges from 5 to 40 percent. The Lucy soil has a thick sandy surface layer. It is on hilltops and the upper part of hillsides. The slope ranges from 5 to 30 percent.

Smithdale soil makes up about 38 percent of the map unit. Typically, the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsurface layer is dark yellowish brown sandy loam to a depth of about 12 inches. The subsoil extends to a depth of 84 inches. The upper part of the subsoil is red sandy clay loam to a depth of about 24 inches. The next layer is red sandy clay loam mottled in shades of brown to a depth of about 36 inches. The lower part is red sandy loam mottled in shades of brown grading to yellowish red as depth increases.

Smithdale soil is very strongly acid or strongly acid throughout. Permeability is moderate. The available water capacity is moderate. Runoff is rapid, and the hazard of erosion is severe. There is no seasonal high water table within a depth of 6 feet.

Lucy soil makes up about 27 percent of the map unit. Typically, the surface layer is brown loamy sand about 3 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of about 21 inches. The subsoil extends to a depth of 62 inches. The upper part of the subsoil, to a depth of about 28 inches, is strong brown sandy loam. The next layer, to a depth of about 32 inches, is yellowish red sandy clay loam. The lower part is sandy clay loam that grades from red to yellowish red as depth increases.

Lucy soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is rapid in the surface layer and subsurface layer and moderate in the subsoil. The available water capacity is moderate. Runoff is slow to medium, and the hazard of erosion is slight. There is no seasonal high water table within a depth of 6 feet.

Included in mapping are Benndale, Lucy, McLaurin, and Saffell soils. These soils are on uplands. Also included are Bibb soils. These soils are in drainageways and on flood plains. The included soils make up about 35 percent of the map unit.

The soils in this map unit are mostly used as woodland.

Because of steepness of slope, rapid runoff, and the hazard of erosion, these soils are poorly suited to cultivated crops. They are poorly suited to pasture grasses and legumes because of low productivity. Permanent vegetation of grasses and legumes or trees should be kept on these soils. Good pasture management includes proper stocking, controlled grazing, and weed and brush control.

Smithdale soil is well suited to slash pine, loblolly pine, shortleaf pine, and longleaf pine. For Smithdale soil, woodland management limitations are slight. Lucy soil is moderately suited to longleaf pine, loblolly pine, and shortleaf pine. For Lucy soil, woodland management limitations are moderate except for seedling mortality, which is severe.

Smithdale and Lucy soils have severe limitations for urban uses because of steepness of slope. Limitations for septic tank absorption fields are severe because of steepness of slope. These limitations can be partially overcome by installing drainage fields on the contour.

Smithdale soil is in capability subclass VIIe, and Lucy soil is in capability subclass VIs. Smithdale soil is in woodland suitability group 2o1, and Lucy soil is in woodland suitability group 3s2.

SS—Smithdale-Saffell-Lucy association, hilly. This map unit consists of gently undulating to steep, well drained soils that formed in loamy and loamy and gravelly sediment in large areas on wooded uplands. These soils are in a regular and repeating pattern. The landform is dominantly hilly and is dissected by many narrow drainageways. Smithdale and Saffell soils mostly are on the sloping to steep hillsides that have a slope gradient that ranges from 5 to 40 percent. Lucy soil has a thick, sandy surface layer. This soil is on undulating to strongly sloping ridges and steep hillsides that have a slope gradient that ranges from 5 to 30 percent. Areas

of these soils range from about 160 to 1,000 acres or more. The slope ranges from 5 to 40 percent.

Smithdale soil makes up about 45 percent of the map unit. Typically, the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsurface layer is yellowish brown sandy loam to a depth of about 12 inches. The upper part of the subsoil, to a depth of about 36 inches, is red sandy clay loam. The next layer, to a depth of about 44 inches, is red sandy loam. The lower part to a depth of 80 inches is red sandy loam mottled in shades of brown.

Smithdale soil is very strongly acid or strongly acid throughout. Permeability is moderate. The available water capacity is moderate. Runoff is rapid, and the hazard of erosion is severe. There is no seasonal high water table within a depth of 6 feet.

Saffell soil makes up about 26 percent of the map unit. Typically, the surface layer, to a depth of 5 inches, is brown sandy loam that is about 10 percent gravel. The subsurface layer, to a depth of about 9 inches, is brown sandy loam that is about 10 percent gravel. The subsoil extends to a depth of about 40 inches. It is about 25 to 60 percent gravel. The upper part is yellowish brown gravelly sandy loam to a depth of about 15 inches. The lower part is yellowish red gravelly sandy clay loam. The underlying material to a depth of 70 inches is yellowish red very gravelly sandy loam that is 60 to 65 percent gravel.

Saffell soil is very strongly acid or strongly acid throughout. Permeability is moderate. The available water capacity is low. Runoff is rapid, and erosion hazard is severe. There is no seasonal high water table within a depth of 6 feet.

Lucy soil makes up about 18 percent of the map unit. Typically, the surface layer is brown loamy sand about 5 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of about 10 inches. Below that, it is light yellowish brown loamy sand mottled in shades of brown to a depth of about 24 inches. The subsoil extends to a depth of 75 inches. The upper part of the subsoil, to a depth of about 32 inches, is yellowish red sandy loam mottled in shades of brown. Below that to a depth of about 55 inches, it is yellowish red sandy clay loam mottled in shades of brown and red. The lower part is red sandy clay loam mottled in shades of brown and yellow.

Lucy soil is very strongly acid or strongly acid throughout. Permeability is rapid in the surface layer and subsurface layer and moderate in the subsoil. The available water capacity is moderate. Runoff is slow to medium, and the hazard of erosion is slight. There is no seasonal high water table within a depth of 6 feet.

Included in mapping are Lucy, Ruston, and Bibb soils. Lucy and Ruston soils are on uplands. Bibb soils are in drainageways and on flood plains. The included soils make up about 11 percent of the map unit.

In most areas, the soils in this map unit are used as woodland. A small acreage is in pasture.

These soils are poorly suited to cultivated crops because of steepness of slope, rapid runoff, and the severe hazard of erosion. These soils are poorly suited to grasses and legumes for hay or pasture because of steepness of slope, rapid runoff, the hazard of erosion, and low productivity. Permanent vegetation of grasses and legumes or trees should be kept on these soils. Good pasture management includes proper stocking, controlled grazing, and weed and brush control.

Smithdale soil is well suited to slash pine, loblolly pine, shortleaf pine, and longleaf pine. For Smithdale soil, woodland management limitations are slight except plant competition, which is moderate. Saffell soil is poorly suited to loblolly pine and shortleaf pine. They are poorly suited to hardwoods because of low productivity. However, pines are the recommended trees to plant. For Saffell soil, woodland management limitations are moderate. Lucy soil is moderately suited to loblolly pine, shortleaf pine, and longleaf pine. Poor trafficability and seedling mortality are limitations because of the sandy surface layer of Lucy soil. Seedling mortality is a severe limitation.

Smithdale, Saffell, and Lucy soils have severe limitations for urban uses and for septic tank absorption fields because of steepness of slope. Absorption fields, however, can be installed on the contour.

Smithdale and Saffell soils are in capability subclass VIIe, and Lucy soil is in capability subclass VIs. Smithdale soil is in woodland suitability group 2o1, Saffell soil is in woodland suitability group 4f2, and Lucy soil is in woodland suitability group 3s2.

StA—Stough fine sandy loam, 0 to 2 percent slopes. This nearly level, somewhat poorly drained soil formed in loamy material. This soil is on stream terraces and broad upland flats.

Typically, the surface layer is dark grayish brown fine sandy loam about 8 inches thick. The subsoil extends to a depth of about 62 inches. The upper part of the subsoil, to a depth of about 16 inches, is light yellowish brown and light brownish gray sandy loam. The next layer, to a depth of about 24 inches, is fine sandy loam mottled in shades of yellow, brown, and gray. The next layer, to a depth of about 34 inches, is fine sandy loam mottled in shades of brown, yellow, and gray. To a depth of about 50 inches, it is sandy loam mottled in shades of brown, gray, and yellow. The lower part of the subsoil is loam mottled in shades of brown and gray.

This Stough soil is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The available water capacity is moderate. Runoff is slow, and the hazard of erosion is slight. During prolonged wet periods in winter and early in the spring, the water table

Figure 12.—A good stand of loblolly pine on Stough fine sandy loam, 0 to 2 percent slopes.

fluctuates between depths of 1 foot and 1 1/2 feet. The surface layer is friable and is easily tilled through a wide range of moisture content.

Included with this soil in mapping are small areas of Prentiss and Savannah soils. Prentiss soils are on stream terraces. Savannah soils are on uplands and on stream terraces.

In most areas, Stough soil is used as woodland. A small acreage is in cropland or pasture.

This soil is well suited to corn, soybeans, and small grains. Alignment of plant rows and surface field ditches are needed to remove excess surface water. Conservation tillage and crop residue on the soil improve fertility and help maintain good tilth.

This soil is well suited to grasses and legumes for pasture or hay. Overgrazing or grazing when the soil is too wet, however, causes surface compaction, excessive runoff, and poor soil tilth. Proper stocking, pasture rotation, timely deferment of grazing, and weed and brush control help to keep the pasture and soil in good condition.

This soil is well suited to loblolly pine (fig. 12), slash pine, sweetgum, cherrybark oak, and water oak. Seasonal wetness is a moderate limitation for woodland management and harvesting of the tree crops. This limitation can be partially overcome by logging during drier periods. Plant competition is a moderate limitation.

The seasonal high water table is a severe limitation for most urban uses. Seasonal wetness and moderately

slow permeability of the subsoil are severe limitations for septic tank absorption fields. These limitations can be partially overcome by installing a larger than average drainage field.

This Stough soil is in capability subclass IIw and in woodland suitability group 2w8.

Prime Farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in Marion County are listed.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, state, and federal levels, as well as individuals, must encourage and facilitate the wise use of our nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to producing food, feed, forage, fiber, and oilseed crops. Such soils have properties that are favorable for the economic production of sustained high yields of crops. The soils need only to be treated and managed using acceptable farming methods. The moisture supply, of course, must be adequate, and the growing season has to be sufficiently long. Prime farmland soils produce the highest yields with minimal inputs of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may be in other uses. They either are used for producing food or fiber or are available for these uses. Urban or built-up land and water areas cannot be considered prime farmland. Urban or built-up land is defined as any contiguous unit of land 10 acres or more in size that is used for nonfarm uses including housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, shooting ranges, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water control structures and spillways.

Prime farmland soils usually get an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not subject to frequent flooding during the growing season. The slope ranges mainly from 0 to 5 percent. For more detailed information on the criteria for prime farmland, consult the local staff of the Soil Conservation Service.

About 129,297 acres, or about 37 percent of Marion County, meets the soil requirements for prime farmland. Areas are scattered throughout the county but are mainly in general soil map units 1, 5, and 9. Approximately 22,000 acres of this land is used for crops. Corn, wheat, soybeans, hay, and rice account for much of the county's total agricultural income each year.

A recent trend in land use in some parts of the county has been the loss of prime farmland to industrial and urban uses. The loss of prime farmland puts pressure on marginal lands, which generally are more erodible, droughty, or difficult to cultivate and usually are less productive.

The following map units, or soils, make up prime farmland in Marion County. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 4. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Soils that have limitations, such as a high water table or flooding, may qualify as prime farmland if these limitations are overcome by such measures as drainage or flood control. Onsite evaluation is necessary to determine if the limitations have been overcome by the corrective measures.

BaA	Bassfield sandy loam, 0 to 2 percent slopes
CaA	Cahaba fine sandy loam, 0 to 2 percent slopes
FaB	Falkner silt loam, 2 to 5 percent slopes
FB	Falkner-Benndale association, undulating
LaA	Latonia sandy loam, 0 to 2 percent slopes
LuA	Lucedale loam, 0 to 2 percent slopes
MnB	McLaurin fine sandy loam, 2 to 5 percent slopes
PxA	Prentiss fine sandy loam, 0 to 2 percent slopes
RuB	Ruston sandy loam, 2 to 5 percent slopes
ShA	Savannah fine sandy loam, 0 to 2 percent slopes
ShB	Savannah fine sandy loam, 2 to 5 percent slopes

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Allen L. Cullen, district conservationist, Soil Conservation Service, helped prepare this section.

According to the 1978 Census of Agriculture, about 66,757 acres in this survey area was used for crops and pasture. Of this total, 21,865 acres was used for cultivated crops, mainly corn, wheat, and soybeans. Cropland acreage has increased significantly in recent years.

Soil erosion is the main concern in management on about 65 percent of the cropland and pasture in Marion County. If the slope on cropland is more than 2 percent, erosion is a hazard. Loss of the surface layer through erosion is damaging for two reasons. Productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging to soils that have a clayey subsoil and to soils that have a fragipan. Examples of these are Falkner, Prentiss, Savannah, and Susquehanna soils.

Soil erosion on farmland results in sedimentation of streams, which increases the flood hazard. Control of erosion minimizes the pollution of streams by sediment and improves the water quality for recreation and for fish and wildlife.

Erosion control reduces runoff, increases infiltration, improves soil tilth, and provides a protective surface cover. A cropping system that keeps a plant cover on the soil for an extended period holds soil erosion losses to amounts that will not reduce the productivity of the soil.

Legumes and grass forage crops on livestock farms reduce erosion on sloping land and also provide nitrogen and improve soil tilth for the following crop.

Gullied areas in pastures can be smoothed to a uniform surface. They can be planted to grass and fertilized to reestablish the areas.

Reducing tillage operations and leaving crop residue on the surface will increase infiltration and reduce runoff and erosion. These practices can be adapted to most soils in the county.

Terraces and diversions reduce slope length, thus reducing runoff and erosion. Benndale, Falkner, McLaurin, Ruston, and Savannah soils are erodible and need terraces. Suitable outlets that have a thick cover of vegetation are needed for safe disposal of terrace water.

Contouring and contour stripcropping are used as erosion control practices in the county. These practices are best suited to terraced fields or to soils that have smooth, uniform slopes.

Information on the design of erosion control systems for each kind of soil can be found in the Technical Guide, available in the local office of the Soil Conservation Service.

Benndale, Cahaba, Latonia, Lucedale, McLaurin, and Ruston soils have good natural drainage. Small areas of

wetter soils, found in drainageways and in depressions, are sometimes near areas of well drained soils.

Most of the soils in the county have a loam, fine sandy loam, or sandy loam surface layer that is light in color and low in organic matter content. Generally, the structure of such soils is weak, and intense rainfall causes a crust to form on the surface. Once the crust forms, it reduces infiltration and increases runoff. Regular additions of crop residue, manure, and other organic material can help to improve soil structure and reduce crust formation.

Fall plowing is generally not a good practice on soils that have a silt loam surface layer because of the crust that forms during winter and spring. Many of the soils are nearly as dense and hard at planting time as they were before they were plowed in the fall. Also, about two-thirds of the cropland consists of sloping to steep soils that are subject to erosion if they are plowed in the fall. Leaving crop residue on the surface is necessary to control erosion on these soils.

Soil tilth is an important factor in the germination of seeds and in the infiltration of water into the soil. Soils that have good tilth are granular and porous.

Soil fertility is naturally low in most soils of the county. Many of the soils are very strongly acid or strongly acid and need applications of ground limestone to raise the pH sufficiently for a good plant growth. Most of the soils have a pH level less than 6.0. The available phosphorus and potash levels are naturally low in most of these soils. On all soils, the addition of lime and fertilizer should be based on the results of soil tests, on the needs of the crop, and on the expected level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to be applied.

Field crops suited to the soils and climate of the survey area include many that are not now commonly grown. Soybeans, wheat, and corn are the principal row crops. Grain sorghum, cotton, rice, vegetable crops, and other similar crops can be grown if economic conditions are favorable. Ryegrass, wheat, oats, and millet are common crops for temporary grazing.

The latest information and suggestions for growing specialty crops can be obtained from the local office of the Cooperative Extension Service or the Soil Conservation Service.

The data about specific soils in this survey can be used in planning future land use patterns. Potential productive capacity in farming should be weighed against soil limitations for nonfarm development.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that insures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations

designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in other parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is shown in table 6. The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Woodland Management and Productivity

Paul W. Dillard, forester, Soil Conservation Service, helped prepare this section.

Commercial forests cover about 55 percent of Marion County, or about 194,000 acres. The commercial forests are made up of five major forest types *(18)*. The approximate extent of each forest type is 6 percent longleaf—slash pine; 14 percent loblolly—shortleaf pine; 36 percent oak—pine; 25 percent oak—hickory; and 19 percent oak—gum—cypress. About 8l percent of the soils on the commercial forest land have a moderate-to-excellent growth rate for timber crops.

Farmers and other private landowners control about 70 percent of the forest land, forest industries control about 25 percent, and other public ownership controls about 5 percent.

Good forest management helps maintain or improve soil productivity and water quality. Forest management activities, such as timber harvesting and site preparation for future tree crops, have the greatest potential for adversely affecting soil productivity and water quality. These practices can cause erosion, nutrient depletion, and soil compaction. Site specific forest management recommendations that consider topography, time, natural site fertility, and the hazard of erosion help prevent damage to soil and water resources *(13)*.

A suitable secondary use for most of the pine woodland is grazing. The grasses, legumes, forbs, and many of the woody plants in the understory can be used for forage. The proper stocking of grazing animals, in relation to the amount of forage produced, helps prevent damage to desirable trees.

This section contains information about the production of both wood crops and forage in woodland.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol (woodland suitability) for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *w* indicates excessive water in or on the soil; *c*, clay in the upper part of the soil; *s*, sandy texture; and *f*, high content of coarse fragments in the soil profile. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: w, c, s, and f.

The third element in the symbol, a numeral, indicates the kind of trees for which the soils in the group are best suited and also indicates the severity of the hazard or limitation. The numerals 1, 2, and 3 indicate slight, moderate, and severe limitations, respectively, and suitability for needle-leaved trees. The numerals 4, 5, and 6 indicate slight, moderate, and severe limitations, respectively, and suitability for broad-leaved trees, The numerals 7, 8, and 9 indicate slight, moderate, and

severe limitations, respectively, and suitability for both needle-leaved and broad-leaved trees.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in a well-managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate,* 25 to 50 percent; and *severe,* more than 50 percent.

Ratings of *plant competition* indicate the degree to which undesirable plants are expected to invade where there are openings in the tree canopy. The invading plants compete with native plants or planted seedlings. A rating of *slight* indicates little or no competition from other plants; *moderate* indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; *severe* indicates that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed to control undesirable plants.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index.* This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

Woodland Understory Vegetation

David W. Sanders, grassland conservationist, Soil Conservation Service, helped prepare this section.

Significant changes often occur in kinds and abundance of plants as the canopy changes regardless of grazing use. Therefore, the forage value rating of grazeable woodland is not an ecological evaluation of the understory. The forage value ratings are based on the percentage of the existing understory plant community that is made up of preferred and desirable plants as they relate to livestock palatability.

Understory vegetation consists of grasses, forbs, shrubs, and other plants. Some woodland, if well managed, can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees.

The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, and the depth and condition of the litter. The density of the canopy determines the amount of light that understory plants receive.

Table 8 shows, for each soil suitable for woodland use, the potential for producing understory vegetation. The total production of understory vegetation includes the herbaceous plants and the leaves, twigs, and fruit of woody plants up to a height of 4 1/2 feet. It is expressed in pounds per acre of air-dry vegetation in favorable, normal, and unfavorable years. In a favorable year, soil moisture is above average during the optimum part of the growing season; in a normal year, soil moisture is average; and in an unfavorable year, it is below average.

Table 8 also lists the common names of the characteristic vegetation on each soil and the percentage composition, by air-dry weight, of each kind of plant. The table shows the kind and percentage of understory plants expected under a canopy density that is most nearly typical of woodland in which the production of wood crops is highest.

Recreation

Ernest E. Dorrill, III, landscape architect, Soil Conservation Service, helped prepare this section.

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the

ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

David R. Thomas, wildlife biologist, Soil Conservation Service, helped prepare this section.

Marion County has a large and varied population of wildlife. White-tailed deer (fig. 13), turkey, and squirrel inhabit the wooded areas. Bobwhite quail, dove, cottontail, meadowlark, and many types of songbirds live in farm areas where they can find food and cover. The wetlands support wood ducks, mallards, Canada geese, rails, shore birds, coots, cranes, and snipe, along with muskrat, mink, nutria, otter, beaver, raccoon, alligators, turtles, and crawfish.

The kinds and numbers of wild animals in Marion County have varied since the area was settled. The most important factor that affects wildlife populations is the way man uses the land.

Before the area was settled, it was mostly forest. Pines were dominant, and hardwoods grew along the streams. Animals that adapted to the forest environment were abundant.

Logging and land clearing destroyed woodland habitat and created vegetative patterns that met the needs of openland wildlife. Wolves and panthers, and later deer and turkeys, disappeared. Bobwhite quail, rabbits, doves, and many types of songbirds became dominant. Reforestation and wildlife management have restored the deer and turkey populations. More intensive farming methods have caused a decline in farm animals and openland wild animals. The kind and numbers of wild animals will continue to change as man's demands on the land change.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of plants suitable as habitat for wildlife.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or

Figure 13.—A deer stand in a pine forest on Prentiss fine sandy loam, 0 to 2 percent slopes.

maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, and clover.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, and wheatgrass.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are loblolly, longleaf, slash, and shortleaf pines.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are wild grape, virburnam, honeysuckle, huckleberry, and pokeberry.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, sloughs (fig. 14), waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, dove, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

William A. Walker, project engineer, Soil Conservation Service, helped prepare this section.

Data for land-use planning and for choosing alternative practices or general designs to overcome unfavorable soil properties and to minimize soil-related failures are presented in this section. The limitations to the use of these data, however, should be well understood.

It should be understood that data generally are not presented for soil material below a depth of 80 inches; also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping; and, also, these data do not eliminate the need for onsite investigations, for testing, or for personnel having expertise in the specific use contemplated.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations must be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings

Figure 14.—An old slough in an area of Cascilla-Chenneby association, frequently flooded. These shallow water areas are very beneficial to wildlife.

in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to: evaluate the potential of areas for residential, commercial, industrial, and recreation uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and

without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost-action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a

plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage (fig. 15), irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas (fig. 16) hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water

Figure 15.—A grade control structure in a drainageway that drains a large area of Bassfield sandy loam, 0 to 2 percent slopes.

Figure 16.—The soils in Marion County are rated according to their limitations for use for embankments, dikes, and levees.

capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent.

Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the

soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium

content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Physical and Chemical Analyses of Selected Soils

D. E. Pettry, professor, Soil Science, Mississippi State University, prepared this section.

The results of physical analysis of several typical pedons in the survey area are given in table 18 and the results of chemical analysis in table 19. The data are for soils sampled at carefully selected sites. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural and Forestry Experiment Station.

Physical Analyses

The particle-size analyses shown in table 18 were obtained using Day's hydrometer method *(6)*. Forty grams of soil were dispersed in a 0.5 percent calgon solution (sodium metaphosphate) by mixing 5 minutes in a mixer. The dispersed soil was transferred to a sedimentation cyclinder, made to 1,000 millimeters and equilibrated overnight in a water bath at 30 degrees C. The suspension was then mixed and allowed to settle. Hydrometer readings were taken at predetermined times to determine the clay content. The sand was separated on a 325-mesh sieve, dried, and weighed. All results are expressed on the basis of ovendry weight at 110 degrees C.

The physical properties of soils, such as infiltration rate and conduction, shrink-swell potential, crusting, consistence, and available water capacity, are closely related to soil texture (the percentage of sand, silt, and clay).

The deep, sloping loamy soils on the uplands, such as Smithdale, Lucy, Ruston, and Saffell soils, are high in sand content. They tend to be droughty because water infiltration is rapid in the coarse textured surface layer.

Soils that formed in siliceous alluvium on flood plains and terraces, such as Bassfield, Jena, Nugent, and Cahaba soils, are sandy and have a medium to low available water capacity.

The clayey Susquehanna soils are high in content of expansive clays. These soils have a high available water capacity, but they tend to shrink and swell upon drying and wetting.

Chemical Analyses

Soil chemical properties, in combination with other soil features, such as permeability, structure, and texture, influence the limitations and potentials of a soil. Chemical properties are not evident in visual observations of a soil, and laboratory analyses are necessary to define the soil characteristics. The amount and type of clay minerals present and the organic matter content largely regulate the chemical nature of soils. These substances have the capacity to attract and hold cations. Exchangeable cations are positive charged elements that are bonded to clay minerals and to organic matter, both of which have a negative charge.

The exchangeable cations may be removed or exchanged through leaching of plant uptake. Through the mechanism of cation exchange, soil acidity may be corrected by liming. It is useful to note that 1 milliequivalent per 100 grams of extractable acidity (hydrogen + aluminum) requires 1,000 pounds of lime (calcium carbonate) per acre to neutralize it.

Soil chemical data are expressed as milliequivalents per 100 grams of dry soil. It is useful to convert milliequivalents per 100 grams of the various cations to the common units of pounds per acre for the plow layer. The plow layer, or topsoil, of average soils to a depth of 6.67 inches weighs about 2 million pounds per acre. The conversions for the cations listed in table 19 are as follows:

Calcium (Ca) meq./100 grams x 400 = pounds per acre.
Magnesium (Mg) meq./100 grams x 240 = pounds per acre.
Potassium (K) meq./100 grams x 780 = pounds per acre.
Sodium (Na) meq./100 grams x 460 = pounds per acre.
Hydrogen (H) meq./100 grams x 20 = pounds per acre.

Many of the soils in Marion County are acid and have a moderate to relatively low capacity to retain plant nutrients (cations) because of the influence of siliceous parent material. However, these soils respond to proper fertilization and management.

The soil taxonomy classification system adopted by the National Cooperative Survey *(17)* uses chemical soil properties as differentiating criteria in some categories. The Alfisol and Ultisol orders, which are classes in the highest category of the system, are separated on the basis of percentage base saturation deep in the subsoil. Ultisols have an argillic horizon that has a base saturation of less than 35 percent; Alfisols have a base saturation greater than 35 percent. The Falkner soil is an Alfisol, and it has a base saturation value greater than 35 percent below a depth of 4.6 feet.

Determinations were made on soil material smaller than 2 millimeters in diameter. Measurements of unit weight were calculated on an ovendry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods *(16)*.

Extractable cations—ammonium acetate pH 7.0, uncorrected; calcium (6N2), magnesium (602), sodium (6P2), potassium (6Q2).
Extractable acidity—barium chloride-triethanolamine I (6H1a).
Cation-exchange capacity—sum of cations (5A3a).
Base saturation—sum of cations, TEA, pH 8.2 (5C3).
Reaction (pH)—1:1 water dilution (8C1a).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(17)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udult (*Ud*, meaning humid, plus *ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Fragiudults (*Frag*, meaning brittle, plus *Udult*, the suborder of the Ultisols that have a fragipan).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Fragiudults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, siliceous, thermic Typic Fragiudults.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series. The Savannah series is an example of fine-loamy, siliceous, thermic Typic Fragiudults in Marion County.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual *(15)*. Many of the technical terms used in the descriptions are defined in Soil Taxonomy *(17)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Bassfield Series

The Bassfield series consists of well drained soils on stream terraces. These soils formed in loamy stream deposits or marine deposits. The slope ranges from 0 to 2 percent. The soils of the Bassfield series are coarse-loamy, siliceous, thermic Typic Hapludults.

Bassfield soils are associated with Cahaba, Jena, and Latonia soils. Cahaba soils are on stream terraces but have a fine-loamy control section. Jena soils are on flood plains. They do not have an argillic horizon. Latonia

soils are on stream terraces. They have a Bt horizon that has hue of 7.5YR or yellower.

Typical pedon of Bassfield sandy loam, 0 to 2 percent slopes; in a pasture 7 miles south of Columbia on State Highway 13, and 350 feet west of the highway; SW1/4SE1/4 sec. 12, T. 2 N., R. 18 W.

Ap—0 to 6 inches; brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine and medium roots; medium acid; abrupt smooth boundary.

A—6 to 10 inches; brown (10YR 5/3) sandy loam; few fine distinct strong brown (7.5YR 5/8) mottles; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.

Bt1—10 to 14 inches; yellowish red (5YR 5/6) loam; few fine distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; many fine roots; sand grains coated and bridged with clay; very strongly acid; clear smooth boundary.

Bt2—14 to 32 inches; red (2.5YR 4/6) loam; moderate medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; very strongly acid; clear smooth boundary.

Bt3—32 to 41 inches; yellowish red (5YR 5/8) sandy loam; few fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; very strongly acid; abrupt smooth boundary.

C1—41 to 62 inches; strong brown (7.5YR 5/6) loamy sand; single grained; loose; very strongly acid; clear smooth boundary.

C2— 62 to 75 inches; reddish yellow (7.5YR 6/8) loamy sand; few fine faint pale brown and few fine distinct strong brown (7.5YR 5/6) mottles; single grained; loose; very strongly acid.

The thickness of the solum is 40 to 60 inches. Reaction is very strongly acid or strongly acid throughout.

The A horizon is dark gray, dark grayish brown, or brown. The Bt horizon is reddish brown, red, or yellowish red. The texture is sandy loam or loam. In the upper 20 inches of the Bt horizon, the average clay content ranges from 8 to l8 percent. The C horizon is very pale brown, reddish yellow, brownish yellow, light yellowish brown, and strong brown, or it is mottled in shades of these colors. The texture ranges from loamy sand to sand and can have as much as 20 percent gravel, by volume.

Benndale Series

The Benndale series consists of well drained, loamy soils on uplands and stream terraces. These soils formed in stream deposits or marine deposits. The slope ranges from 0 to 5 percent. The soils of the Benndale series are coarse-loamy, siliceous, thermic Typic Paleudults.

Benndale soils are associated with Falkner and Susquehanna soils. Falkner soils are on uplands but have a fine-silty control section. These soils are somewhat poorly drained. Susquehanna soils are on uplands, but they are somewhat poorly drained. These soils have a clayey Bt horizon and have vertic properties.

Typical pedon of Benndale sandy loam, in an area of Falkner-Benndale association, undulating; 6 miles southeast of Columbia on old Purvis Road, south 2.5 miles on a county road, and about 2 miles east on a woods road in the Hugh White Game Reserve; SE1/4SW1/4 sec. 34, T. 3 N., R. 17 W.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

E—4 to 8 inches; brown (10YR 5/3) sandy loam; few fine faint dark brown mottles; weak fine granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

Bt1—8 to 16 inches; yellowish brown (10YR 5/6) sandy loam; few fine faint brown mottles; weak fine granular structure; friable; many fine roots; sand grains coated and bridged with clay; strongly acid; clear smooth boundary.

Bt2—16 to 26 inches; strong brown (7.5YR 5/8) sandy loam; weak fine granular structure; friable; few fine roots; sand grains coated and bridged with clay; few fine quartz pebbles; very strongly acid; clear wavy boundary.

Bt3—26 to 34 inches; yellowish brown (10YR 5/8) sandy loam; weak and moderate medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; few fine quartz pebbles; very strongly acid; clear wavy boundary.

Bt4—34 to 40 inches; yellowish brown (10YR 5/6) sandy loam; common medium distinct strong brown (7.5YR 5/8) and few fine faint pale brown mottles; weak and moderate medium subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

Bt5—40 to 52 inches; light yellowish brown (10YR 6/4) sandy loam; common medium distinct strong brown (7.5YR 5/8) and few fine faint brown and gray mottles; weak and moderate medium subangular blocky structure; friable; sand grains coated and bridged with clay; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt6—52 to 60 inches; mottled brownish yellow (10YR 6/8), strong brown (7.5YR 5/8), and light brownish gray (10YR 6/2) sandy loam; weak and moderate medium subangular blocky structure; friable; sand grains coated and bridged with clay; thin patchy clay

films on faces of peds; very strongly acid; gradual wavy boundary.

BC—60 to 70 inches; mottled gray (10YR 6/1), yellowish brown (10YR 5/8), strong brown (7.5YR 5/8), and red (2.5YR 4/8) sandy loam; moderate medium subangular blocky structure; friable; sand grains coated and bridged with clay; thin patchy clay films on faces of a few peds; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is very strongly acid or strongly acid throughout.

The A horizon is dark gray, dark grayish brown, very dark grayish brown, dark brown, or brown. The texture is fine sandy loam or sandy loam. The E horizon is brown or light yellowish brown. The texture is fine sandy loam or sandy loam. The Bt horizon is yellowish brown, light yellowish brown, brownish yellow, or strong brown. Few to many gray, brown, and red mottles can occur in the lower part of the Bt horizon. The texture is sandy loam, fine sandy loam, sandy clay loam, or loam. In the upper 20 inches of the Bt horizon, the clay content ranges from 8 to 18 percent. The BC horizon is mottled in shades of red, gray, and brown, or it has a matrix color of red, reddish brown, or yellowish red.

Bibb Series

The Bibb series consists of poorly drained soils in drainageways and on flood plains. These soils formed in stratified loamy alluvium. The slope ranges from 0 to 2 percent. The soils of the Bibb series are coarse-loamy, siliceous, acid, thermic Typic Fluvaquents.

Bibb soils are associated with Croatan, Dorovan, and Guyton soils. Croatan and Dorovan soils are very poorly drained. They are on flood plains and in drainageways in slightly lower positions than the Bibb soils. Organic soils make up the upper part of the profile of the Croatan and Dorovan soils. Guyton soils are on flood plains or stream terraces. They have a fine-silty control section.

Typical pedon of Bibb silt loam, frequently flooded; in a woods about 12 miles northeast of Columbia on State Highway 44, about 4 miles north on a county road, and 200 feet west of the road; SE1/4SE1/4 sec. 11, T. 5 N., R. 17 W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint grayish brown mottles; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

Ag—6 to 11 inches; gray (10YR 5/1) silt loam; few fine distinct yellowish brown (10YR 5/6) and few fine faint dark grayish brown mottles; weak fine granular structure; friable; many fine roots; strongly acid; clear wavy boundary.

Cg1—11 to 18 inches; light brownish gray (10YR 6/2) fine sandy loam; common medium distinct brownish yellow (l0YR 6/6) and few fine distinct dark yellowish brown (10YR 3/4) mottles; massive; friable; few fine roots; few fine brown concretions; strongly acid; clear wavy boundary.

Cg2—18 to 40 inches; light gray (10YR 6/1) sandy loam; common medium distinct strong brown (7YR 5/6) mottles; massive; loose; few fine black concretions; strongly acid; clear wavy boundary.

Cg3—40 to 62 inches; light gray (10YR 6/1) loam; common medium distinct strong brown (7.5YR 5/8) mottles; massive; friable; very strongly acid; clear wavy boundary.

Cg4—62 to 75 inches; light brownish gray (10YR 6/2) sandy loam; common medium distinct strong brown (7.5YR 5/6) and few fine distinct brownish yellow (10YR 6/6) mottles; massive; loose; few fine pockets of loam; very strongly acid.

Reaction is very strongly acid or strongly acid throughout the solum.

The A horizon is gray, dark gray, dark grayish brown, or brown. The Ag horizon is light gray, light brownish gray, or gray. The texture is silt loam or sandy loam. The Cg horizon is gray, light gray, dark gray, or light brownish gray, and it has few to many mottles or strata in shades of brown and yellow. The texture is fine sandy loam, sandy loam, or loam. This horizon is commonly stratified and can have strata of loamy sand. In the 10- to 40-inch control section, the average clay content is less than 18 percent.

Bigbee Series

The Bigbee series consists of excessively drained soils on stream flood plains. These soils formed in sandy material. The slope ranges from 0 to 2 percent. The soils of the Bigbee series are thermic, coated Typic Quartzipsamments.

Bigbee soils are associated with Jena and Nugent soils. Jena soils are on higher elevations on flood plains than Bigbee soils. They have a coarse-loamy control section and a B horizon. Nugent soils are on flood plains near streams and have strata of finer textured material than the Bigbee soils.

Typical pedon of Bigbee loamy fine sand, in an area of Jena-Bigbee complex, frequently flooded; 9 miles north of Columbia on State Highway 35, 400 feet east on a county road, and 300 feet north of the road; NW1/4SE1/4 sec. 22, T. 5 N., R. 18 W.

A—0 to 6 inches; brown (10YR 4/3) loamy fine sand; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; clear smooth boundary.

C1—6 to 14 inches; yellowish brown (10YR 5/4) loamy sand; single grained; loose; few fine roots; very strongly acid; gradual smooth boundary.

C2—14 to 32 inches; brownish yellow (10YR 6/6) loamy sand; single grained; loose; few pockets of uncoated sand grains; few fine roots; very strongly acid; clear smooth boundary.
C3—32 to 40 inches; light yellowish brown (10YR 6/4) loamy sand; few fine faint yellowish brown mottles; single grained; loose; few pockets of uncoated sand grains; very strongly acid; clear smooth boundary.
C4—40 to 52 inches; very pale brown (10YR 7/3) sand; few fine distinct brownish yellow (10YR 6/6) mottles; single grained; loose; very strongly acid; gradual smooth boundary.
C5—52 to 70 inches; light yellowish brown (10YR 6/4) sand; few fine faint very pale brown mottles; single grained; loose; very strongly acid.

Reaction is very strongly acid or strongly acid throughout the solum.

The A horizon is brown, dark grayish brown, or dark yellowish brown. The texture is loamy fine sand, loamy sand, or sand. The upper part of the C horizon is very pale brown, light yellowish brown, yellowish brown, brownish yellow, or yellow. The texture is loamy sand, sand, or fine sand. The lower part of the C horizon is very pale brown, pale brown, or light yellowish brown. The texture is sand, fine sand, or loamy sand. Some pedons have a few pockets of uncoated sand grains.

Cahaba Series

The Cahaba series consists of well drained soils on stream terraces. These soils formed in loamy sediment. The slope ranges from 0 to 2 percent. The soils of the Cahaba series are fine-loamy, siliceous, thermic Typic Hapludults.

Cahaba soils are associated with Bassfield, Prentiss, and Stough soils. Bassfield soils are in similar positions on stream terraces as Cahaba soils but have a coarse-loamy control section. Like the Cahaba soils, Prentiss soils are also on stream terraces but have a coarse-loamy control section and a fragipan at a depth of about 25 inches. Stough soils are on upland flats and stream terraces. They are somewhat poorly drained and have about 40 to 55 percent, by volume, of brittle and compact fragic material in the Btx horizon.

Typical pedon of Cahaba fine sandy loam, 0 to 2 percent slopes; in a pasture about 0.8 mile east of Columbia on U.S. Highway 98, 0.9 mile northeast on old State Highway 44 to about 500 feet north of National Guard road, and 500 feet west of the road; SE1/4SW1/4 sec. 33, T. 4 N., R. 18 W.

Ap—0 to 5 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.
A/B—5 to 8 inches; brown (10YR 4/3) loam (A) and yellowish red (5YR 4/6) sandy clay loam (B); weak fine and moderate medium subangular blocky structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.
Bt1—8 to 16 inches; red (2.5YR 4/6) sandy clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; few thin patchy clay films on faces of peds; strongly acid; clear wavy boundary.
Bt2—16 to 24 inches; red (2.5YR 5/6) sandy clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; patchy clay films on faces of peds; strongly acid; clear wavy boundary.
Bt3—24 to 38 inches; yellowish red (5YR 5/6) loam; moderate fine and medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; few patchy clay films on faces of peds; strongly acid; clear wavy boundary.
C1—38 to 46 inches; yellowish red (5YR 5/6) sandy loam; common medium distinct red (2.5YR 4/8) mottles; massive; very friable; strongly acid; clear wavy boundary.
C2—46 to 80 inches; strong brown (7.5YR 5/6) sandy loam; few fine distinct yellowish red (5YR 5/8) mottles; massive; very friable; strongly acid.

The thickness of the solum is 36 to 60 inches. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A or Ap horizon is brown, very dark grayish brown, dark grayish brown, or grayish brown. The A/B horizon has material from both the A horizon and the B horizon. The A horizon material is dark brown or brown loam. The B horizon material is yellowish red sandy clay loam or loam. Some pedons have a light yellowish brown E horizon. The Bt horizon is a yellowish red or red. Some pedons are mottled in shades of yellow and brown in the lower part of the Bt horizon. The texture is loam, clay loam, or sandy clay loam. In the upper 20 inches of the B horizon, the clay content is 18 to 35 percent. In some pedons, a BC horizon, if present, is yellowish red or red, or it is mottled in shades of yellow and brown. The texture is fine sandy loam or sandy loam. The C horizon ranges from yellowish brown to red. Some pedons are mottled in shades of yellow, brown, and gray. The texture is sand, loamy sand, sandy loam, or fine sandy loam.

Cascilla Series

The Cascilla series consists of well drained, nearly level soils on broad flood plains. These soils formed in silty alluvium. The slope ranges from 0 to 2 percent. The soils of the Cascilla series are fine-silty, mixed, thermic Fluventic Dystrochrepts.

Cascilla soils are associated with Chenneby, Jena, and Nugent soils. Chenneby soils are in lower positions on

the flood plains than Cascilla soils. They are somewhat poorly drained. Jena soils are adjacent to Cascilla soils. They are in higher positions on the flood plains and have a coarse-loamy control section. Nugent soils are on flood plains and sandbars near streams. They are stratified and have a sandy control section.

Typical pedon of Cascilla silt loam, frequently flooded; in a pasture 0.5 mile west of State Highway 13 on U.S. Highway 98, and about 200 feet north of the road; NW1/4SE1/4 sec. 8, T. 3 N., R. 18 W.

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

Bw1—5 to 12 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; many fine roots; strongly acid; clear wavy boundary.

Bw2—12 to 22 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; strongly acid; clear wavy boundary.

Bw3—22 to 30 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; few fine roots; strongly acid; clear wavy boundary.

BC—30 to 48 inches; yellowish brown (10YR 5/4) silt loam; few fine faint brown mottles; weak medium subangular blocky structure; friable; strongly acid; clear wavy boundary.

2C—48 to 80 inches; yellowish brown (10YR 5/6) fine sandy loam; massive; very friable; strongly acid.

The thickness of the solum is 45 to 80 inches. Reaction is very strongly acid or strongly acid throughout.

The Ap horizon is dark brown, brown, yellowish brown, or dark yellowish brown. The Bw horizon is dark brown, brown, dark yellowish brown, or yellowish brown. Few to common mottles in shades of gray are at a depth of more than 24 inches in some pedons. The texture is silt loam or silty clay loam. The BC horizon is dark brown, brown, yellowish brown, or dark yellowish brown. Some pedons are mottled in shades of gray. The texture is silt loam or silty clay loam. The 2C horizon is grayish brown, brown, yellowish brown, or dark yellowish brown. The texture is sand, fine sandy loam, loam, or silt loam.

Chenneby Series

The Chenneby series consists of somewhat poorly drained, nearly level soils on broad flood plains. These soils formed in silty alluvium. The slope ranges from 0 to 2 percent. The soils of the Chenneby series are fine-silty, mixed, thermic Fluvaquentic Dystrochrepts.

Chenneby soils are associated with Cascilla soils. Cascilla soils are on flood plains but are well drained.

Typical pedon of Chenneby silt loam, in an area of Cascilla-Chenneby association, frequently flooded; 3.2 miles south of Columbia on old State Highway 13, 0.3 mile west on a woods road, and 50 feet north of the road; SW1/4NE1/4 sec. 28, T. 3 N., R. 18 W.

A1—0 to 4 inches; dark brown (10YR 3/3) silt loam; weak fine granular structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.

A2—4 to 10 inches; dark yellowish brown (10YR 4/4) silt loam; few fine faint light brownish gray mottles; weak fine granular structure; friable; few fine roots; strongly acid; gradual wavy boundary.

Bw—10 to 23 inches; yellowish brown (10YR 5/4) silt loam; common medium faint light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; clear wavy boundary.

Bg1—23 to 44 inches; grayish brown (10YR 5/2) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual smooth boundary.

Bg2—44 to 58 inches; grayish brown (2.5Y 5/2) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; very strongly acid; clear smooth boundary.

Cg—58 to 70 inches; light brownish gray (2.5YR 6/2) sandy loam; common medium prominent strong brown (7.5YR 5/6) mottles; massive; very friable; very strongly acid.

The thickness of the solum is 40 to 70 inches. Reaction is very strongly acid or strongly acid throughout.

The A horizon is dark grayish brown, dark brown, brown, or dark yellowish brown. The Bw horizon is brown, yellowish brown, or dark brown and is mottled in shades of brown and gray. The texture is silt loam or silty clay loam. The Bg horizon is grayish brown or dark grayish brown and is mottled in shades of brown. The texture is silty clay loam or silt loam. The 10- to 40-inch control section is 20 to 35 percent clay and more than 60 percent silt. The Cg horizon is grayish in color and is mottled in shades of brown and olive. The texture is silt loam, loam, sandy loam, or fine sandy loam.

Croatan Series

The Croatan series consists of very poorly drained soils in drainageways. These soils formed in decomposed organic material underlain by loamy alluvium. The slope is less than 1 percent. The soils of the Croatan series are loamy, siliceous, dysic, thermic Terric Medisaprists.

Croatan soils are associated with Bibb, Dorovan, and Johnston soils. Bibb and Johnston soils are in drainageways and on flood plains. They are mineral soils. Dorovan soils are in similar or slightly lower positions on flood plains than Croatan soils. Dorovan soils have an organic horizon that extends to a depth of more than 51 inches.

Typical pedon of Croatan muck, in an area of Johnston-Croatan complex, frequently flooded; in a swamp hardwoods on a narrow flood plain 12 miles northeast of Columbia on State Highway 44, about 4 miles north on a county road, and 1,000 feet east of the road; NE1/4SW1/4 sec. 12, T. 5 N., R. 17 W.

Oa1—0 to 7 inches; very dark gray (10YR 3/1) decomposed sapric material; about 30 percent fiber unrubbed, less than 5 percent rubbed; woody fibers remain after rubbing; massive; very friable; many fine and medium roots; few partially decomposed leaves, roots, and twigs; extremely acid; gradual wavy boundary.

Oa2—7 to 36 inches; black (10YR 2/1) decomposed organic matter; about 25 percent fibers unrubbed, less than 3 percent rubbed; woody fibers remain after rubbing; massive; nonsticky; few fine roots; common fragments of partially decomposed roots and limbs; extremely acid; clear wavy boundary.

2Cg1—36 to 54 inches; gray (10YR 5/1) loam; common medium faint light brownish gray mottles; massive; nonsticky; very strongly acid; gradual wavy boundary.

2Cg2—54 to 65 inches; light brownish gray (2.5Y 6/2) loam; common medium distinct dark gray (10YR 4/1) mottles; massive; nonsticky; very strongly acid.

The thickness of the organic material is 16 to 40 inches. Reaction is very strongly acid or strongly acid in the underlying material.

The O horizon is black, very dark gray, very dark grayish brown, or very dark brown. The fiber content is 2 to 30 percent unrubbed, less than 10 percent rubbed. The 2Cg horizon is gray, dark gray, grayish brown, and light brownish gray. The texture is loam, sandy loam, sandy clay loam, and silty clay loam.

Dorovan Series

The Dorovan series consists of very poorly drained soils in drainageways and on flood plains. These soils formed in sapric material. The slope is less than 1 percent. The soils of the Dorovan series are dysic, thermic Typic Medisaprists.

Dorovan soils are associated with Bibb, Croatan, and Johnston soils. Bibb and Johnston soils are mineral soils. These soils are in drainageways and on flood plains. Croatan soils are in similar positions on flood plains as Dorovan soils and have an organic horizon that is less than 51 inches thick.

Typical pedon of Dorovan muck, in an area of Dorovan-Croatan association, frequently flooded; in a swamp hardwoods in a wide drainageway 3.5 miles south of Foxworth on State Highway 35, 3,500 feet east on a woods road, 500 feet south on a field road, and 1,400 feet southwest; NE1/4NW1/4 sec. 1, T. 2 N., R. 13 E.

Oa1—0 to 10 inches; very dark gray (10YR 3/1) muck; about 30 percent fiber unrubbed, less than 5 percent rubbed; woody fibers remain after rubbing; massive; nonsticky; many fine and medium roots; few partially decomposed leaves, roots, and twigs; extremely acid; gradual wavy boundary.

Oa2—10 to 58 inches; black (10YR 2/1) muck; about 35 percent fibers unrubbed, less than 5 percent rubbed; woody fibers; massive; nonsticky; many medium roots; few woody fragments; extremely acid; clear wavy boundary.

2Cg—58 to 65 inches; olive gray (5Y 5/2) loam; massive; nonsticky; very strongly acid.

The thickness of the organic material is 51 inches to more than 80 inches. Reaction is extremely acid in the organic layers and very strongly acid or strongly acid in the underlying material.

The O horizon is black, very dark gray, very dark brown, or very dark grayish brown. It has 10 to 40 percent fiber unrubbed and less than 1/6 of the volume when rubbed. The 2Cg horizon is gray, grayish brown, dark gray, or olive gray. The texture is sand, loamy sand, sandy loam, or loam.

Falkner Series

The Falkner series consists of somewhat poorly drained soils on uplands. These soils formed in a mantle of silty material underlain by clayey deposits. The slope ranges from 0 to 8 percent. The soils of the Falkner series are fine-silty, siliceous, thermic Aquic Paleudalfs.

Falkner soils are associated with Benndale, Savannah, and Susquehanna soils. Benndale soils are on uplands and stream terraces. They have a coarse-loamy control section. Savannah soils are on uplands and stream terraces. They have a fragipan. Susquehanna soils are on upland ridges and hillsides. These soils have a fine control section and have vertic properties.

Typical pedon of Falkner silt loam, 2 to 5 percent slopes; in a pasture 9.5 miles east of Columbia on U.S. Highway 98, 1.6 miles north along a county road, and 1,200 feet west of the road; NE1/4NE1/4 sec. 23, T. 4 N., R. 17 W.

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; friable; many fine and medium roots; medium acid; abrupt smooth boundary.

E—5 to 9 inches; pale brown (10YR 6/3) silt loam; weak fine granular structure; friable; many fine and medium roots; medium acid; clear wavy boundary.

Bt—9 to 18 inches; yellowish brown (10YR 5/6) silt loam; few fine faint light yellowish brown mottles; moderate medium subangular blocky structure; friable; many fine roots; thin patchy clay films on faces of peds; very strongly acid; clear wavy boundary.

2Bt1—18 to 32 inches; mottled light yellowish brown (10YR 6/4), red (2.5YR 4/8), and light brownish gray (10YR 6/2) silty clay loam; moderate medium subangular and angular blocky structure; firm; few fine roots; common patchy clay films on faces of peds; very strongly acid; clear wavy boundary.

2Bt2—32 to 56 inches; mottled yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and red (10YR 4/6) silty clay; moderate medium angular blocky structure; very firm, plastic and sticky; patchy clay films on faces of peds; very strongly acid; clear wavy boundary.

2Bt3—56 to 65 inches; mottled light gray (10YR 7/2), red (10R 4/6), and yellowish brown (10YR 5/8) silty clay; moderate medium angular blocky structure; firm, plastic and sticky; clay films on faces of peds; strongly acid.

The thickness of the solum is more than 60 inches. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A horizon is very dark grayish brown, dark gray, dark grayish brown, pale brown, and yellowish brown. The Bt horizon is yellowish brown, light yellowish brown, pale brown, or brownish yellow. The texture is silt loam or silty clay loam. The 2Bt horizon is light brownish gray, gray, or it is mottled in shades of brown, gray, yellow, or red. The texture is silty clay loam, silty clay, or clay.

Guyton Series

The Guyton series consists of poorly drained soils on flood plains and stream terraces. These soils formed in silty material. The slope ranges from 0 to 1 percent. The soils of the Guyton series are fine-silty, siliceous, thermic Typic Glossaqualfs.

Guyton soils are associated with Bibb and Stough soils. Bibb soils are in drainageways and on flood plains. They have a coarse-loamy control section. Stough soils are on upland flats and stream terraces. These soils are somewhat poorly drained. They have a horizon in the subsoil that is 40 to 55 percent, by volume, brittle and compact material.

Typical pedon of Guyton silt loam, frequently flooded; in a pasture about 4 miles north of Columbia on State Highway 13, about 2,500 feet west on a private road, and 100 feet north of the road; SW1/4SE1/4 sec. 24, T. 4 N., R. 18 W.

Ap—0 to 5 inches; grayish brown (10YR 5/2) silt loam; few fine faint dark grayish brown mottles; weak fine granular structure; friable; many fine and medium roots; extremely acid; abrupt smooth boundary.

Eg1—5 to 9 inches; light brownish gray (10YR 6/2) silt loam; few fine distinct strong brown mottles; weak fine granular structure; friable; many fine and medium roots; extremely acid; clear smooth boundary.

Eg2—9 to 17 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct (2.5Y 5/6) light olive brown mottles; weak medium subangular blocky structure; friable; few fine roots; few silt coatings and clay films on faces of peds; extremely acid; clear wavy boundary.

B/E—17 to 24 inches; light brownish gray (10YR 6/2) silt loam (B); few fine distinct light olive brown (2.5Y 5/6) mottles; weak medium subangular blocky structure; friable; about 15 percent tongues of gray (10YR 5/1) silt loam (E) about 2 inches wide extend through the horizon; few silt coatings and clay films on faces of peds; very strongly acid; clear wavy boundary.

Btg1—24 to 36 inches; grayish brown (2.5Y 5/2) silt loam; common coarse distinct light olive brown (2.5Y 5/4) and few fine faint brown mottles; moderate medium subangular blocky structure; firm, plastic and sticky; tongues of gray silt loam up to 2 inches wide extend through the horizon; few silt coatings and patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—36 to 50 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium distinct light olive brown (2.5Y 5/4) and few fine faint strong brown mottles; moderate medium subangular blocky structure; firm, plastic and sticky; few silt coatings and patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—50 to 62 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium distinct strong brown (7.5YR 5/6) and few fine faint light yellowish brown mottles; moderate medium subangular blocky structure; firm, plastic and sticky; few silt coatings and patchy clay films on faces of peds; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is extremely acid to strongly acid throughout.

The A horizon or the Ap horizon is dark grayish brown or grayish brown. The Eg horizon is grayish brown, light brownish gray, light gray, or gray. The Btg horizon is light brownish gray, light gray, gray, olive gray, or grayish brown. The texture is silt loam, silty clay loam, or clay loam.

Jena Series

The Jena series consists of well drained soils on flood plains of large streams. These soils formed in loamy sediment. The slope ranges from 0 to 2 percent. The soils of the Jena series are coarse-loamy, siliceous, thermic Fluventic Dystrochrepts.

Jena soils are associated with Bassfield, Bigbee, Cascilla, and Nugent soils. Bassfield soils are on stream terraces. They have an argillic horizon. Bigbee soils are on flood plains. They do not have a B horizon. Cascilla soils are on flood plains. They have a fine-silty control section. Nugent soils are on flood plains and sandbars next to the streams. They are stratified and have a sandy control section.

Typical pedon of Jena fine sandy loam, frequently flooded; in a pasture about 0.75 mile north of Foxworth on State Highway 35, 1 mile east on a private road, and 30 feet north on the road; NE1/4NE1/4 sec. 11, T. 3 N., R. 13 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine grandular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

Bw1—6 to 13 inches; brown (10YR 4/3) fine sandy loam; weak fine and medium subangular blocky structure; friable; many fine roots; strongly acid; clear smooth boundary.

Bw2—13 to 33 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; few small pockets of uncoated sand grains; strongly acid; gradual smooth boundary.

C1—33 to 58 inches; yellowish brown (10YR 5/6) loamy fine sand; structureless; loose; common medium pockets of uncoated sand grains; very strongly acid; gradual wavy boundary.

C2—58 to 70 inches; yellowish brown (10YR 5/6) sand; structureless; loose; very strongly acid.

The thickness of the solum is 30 to 50 inches. Reaction is very strongly acid or strongly acid throughout.

The A horizon is dark grayish brown, grayish brown, dark brown, or brown. The texture is fine sandy loam or silt loam. The B horizon is pale brown, light yellowish brown, yellowish brown, strong brown, or brown. The texture is silt loam, very fine sandy loam, fine sandy loam, sandy loam, or loamy fine sand. The C horizon is pale brown, light yellowish brown, light brown, brown, yellowish brown, or dark yellowish brown. The texture is fine sandy loam, sandy loam, or loamy fine sand. Sand strata at a depth of more than 40 inches range from none to common.

Johnston Series

The Johnston series consists of very poorly drained soils in drainageways and on flood plains. These soils formed in loamy stratified sediment. The slope is less than 1 percent. The soils of the Johnston series are coarse-loamy, siliceous, acid, thermic Cumulic Humaquepts.

Johnston soils are associated with Croatan and Dorovan soils. Croatan and Dorovan soils are in drainageways and on flood plains. They are organic soils.

Typical pedon of Johnston mucky loam, in an area of Johnston-Croatan complex, frequently flooded; in an area of swamp hardwoods on a narrow flood plain 7 miles northeast of Columbia on State Highway 44, 0.5 mile north on a county road, 1 mile west on the county road, and about 300 feet north of the road; NE1/4NE1/4 sec. 7, T. 4 N., R. 17 W.

A—0 to 24 inches; very dark gray (10YR 3/1) mucky loam; massive; friable; few fine and medium roots; very strongly acid; clear wavy boundary.

Clg—24 to 32 inches; dark gray (10YR 4/1) loam; massive; slightly sticky; few fine roots; very strongly acid; abrupt smooth boundary.

Cg2—32 to 50 inches; light brownish gray (10YR 6/2) sandy loam; few fine faint dark grayish brown mottles; single grained; loose; nonsticky; lenses and pockets of sandy material; strongly acid; gradual smooth boundary.

Cg3—50 to 70 inches; gray (10YR 6/1) loamy sand; single grained; loose; nonsticky; lenses and pockets of sandy material; strongly acid.

The organic matter content of the A horizon is 8 to 18 percent. Reaction is very strongly acid or strongly acid throughout.

The A horizon is black, very dark gray, or very dark grayish brown. The C1g horizon is dark gray or dark grayish brown. The texture is loam or sandy loam. The C2g horizon and C3g horizon are gray or light brownish gray. The texture is sandy loam, loamy sand, and sand. These horizons are stratified and have texture that ranges from sandy clay loam to sand.

Latonia Series

The Latonia series consists of well drained soils on stream terraces. These soils formed in loamy alluvium. The slope ranges from 0 to 2 percent. The soils of the Latonia series are coarse-loamy, siliceous, thermic Typic Hapludults.

Latonia soils are associated with Bassfield, Prentiss, and Savannah soils. Bassfield soils are in similar positions as the Latonia soils but have a redder Bt horizon. Prentiss soils are adjacent to Latonia soils.

Prentiss soils have a fragipan. Savannah soils are adjacent to Latonia soils. Savannah soils have a fine-loamy control section, and they have a fragipan.

Typical pedon of Latonia sandy loam, 0 to 2 percent slopes; in a cultivated field 8 miles south of Columbia on State Highway 13, 1.3 miles southwest on a county road, 400 feet east on a gravel road, and 30 feet north of the road; NW1/4SE1/4 sec. 24, T. 2 N., R. 18 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) sandy loam; few fine faint light yellowish brown mottles; weak fine granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

Bt1—8 to 14 inches; yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; friable; common fine and medium roots; sand grains coated and bridged with clay; strongly acid; clear smooth boundary.

Bt2—14 to 22 inches; yellowish brown (10YR 5/6) sandy loam; few fine faint light yellowish brown mottles; weak medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; strongly acid; gradual smooth boundary.

BC—22 to 37 inches; yellowish brown (10YR 5/8) sandy loam; common medium faint light yellowish brown, and few fine distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; abrupt smooth boundary.

2C1—37 to 62 inches; brownish yellow (10YR 6/6) sand; few fine faint light yellowish brown and yellowish brown mottles; single grained; loose; about 10 percent medium and coarse quartz pebbles; very strongly acid; clear smooth boundary.

2C2—62 to 80 inches; very pale brown (10YR 7/3) sand; few fine distinct brownish yellow (10YR 6/8) mottles; single grained; loose; about 2 percent medium quartz pebbles; very strongly acid.

The thickness of the solum is 20 to 40 inches. Reaction is very strongly acid or strongly acid throughout.

The A horizon is dark gray, dark grayish brown, or very dark grayish brown. The Bt horizon is strong brown, brownish yellow, yellowish brown, or dark yellowish brown. The texture is sandy loam, fine sandy loam, or loam. In the upper 20 inches of the B horizon, the clay content ranges from 10 to 16 percent. The C horizon is variable in color and ranges from white to yellowish brown. The texture is loamy sand or sand. The gravel content ranges from 0 to about 10 percent.

Lucedale Series

The Lucedale series consists of well drained soils on uplands. These soils formed in loamy marine sediment. The slope ranges from 0 to 2 percent. The soils of the Lucedale series are fine-loamy, siliceous, thermic Rhodic Paleudults.

Lucedale soils are associated with McLaurin and Ruston soils. McLaurin soils are adjacent to Lucedale soils on ridges and side slopes. McLaurin soils have a coarse-loamy control section. Ruston soils also are adjacent to Lucedale soils on ridges and side slopes. These soils have a moist value of 4 or more throughout the solum.

Typical pedon of Lucedale loam, 0 to 2 percent slopes; in a cultivated area 6.5 miles north of Columbia on State Highway 13, 0.5 mile east on a farm road, and 50 feet south of the road; SE1/4NW1/4 sec. 1, T. 4 N., R. 19 W.

Ap—0 to 6 inches; dark brown (10YR 3/3) loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

Bt1—6 to 32 inches; dark red (2.5YR 3/6) loam; moderate medium subangular blocky structure; friable; many fine roots; patchy clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—32 to 60 inches; dark red (2.5YR 3/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; patchy clay films on faces of peds; strongly acid.

The thickness of the solum is 60 inches to more than 80 inches. Reaction is very strongly acid or strongly acid throughout.

The A horizon is dark reddish brown, dusky red, or dark brown. The Bt horizon is dusky red, dark reddish brown, or dark red. Some pedons have red colors in the lower part of the B2t horizon. The texture is sandy clay loam, clay loam, or loam. The upper 20 inches of the Bt horizon is 20 to 30 percent clay.

Lucy Series

The Lucy series consists of well drained soils on hilly uplands. These soils have a thick, sandy surface layer. They formed in loamy marine sediment. The slope ranges from 5 to 30 percent. The soils of the Lucy series are loamy, siliceous, thermic Arenic Paleudults.

Lucy soils are associated with McLaurin, Saffell, and Smithdale soils. McLaurin soils are on slopes that have gradients of less than 8 percent. Saffell soils are adjacent to Lucy soils on slopes. They have a B horizon that has 35 to 70 percent, by volume, of gravel. Smithdale soils are on steeper slopes than Lucy soils and have a fine-loamy control section. Smithdale soils have an A horizon that is less than 20 inches thick.

Typical pedon of Lucy loamy sand, in an area of Smithdale-Lucy association, hilly; in a woodland 6 miles southeast of Columbia on old Purvis Road, about 0.6

mile north on a county road, and about 1,500 feet west of the road; NW1/4SW1/4 sec. 17, T. 3 N., R. 17 W.

A—0 to 3 inches; brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.
E1—3 to 10 inches; yellowish brown (10YR 5/4) loamy sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual smooth boundary.
E2—10 to 21 inches; yellowish brown (10YR 5/6) loamy sand; weak fine granular structure; very friable; few fine and medium roots; strongly acid; clear smooth boundary.
BA—21 to 28 inches; strong brown (7.5YR 5/8) sandy loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; gradual smooth boundary.
Bt1—28 to 32 inches; yellowish red (5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; clay films on faces of peds; few pockets of uncoated sand grains; strongly acid; gradual wavy boundary.
Bt2—32 to 42 inches; red (2.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; clay films on faces of peds; few pockets of uncoated sand grains; strongly acid; gradual wavy boundary.
Bt3—42 to 62 inches; yellowish red (5YR 5/8) sandy clay loam; few pockets of uncoated sand grains; moderate medium subangular blocky structure; friable; clay films on faces of peds; strongly acid.

The thickness of the solum is more than 60 inches. Reaction is very strongly acid or strongly acid throughout.

The A horizon is dark grayish brown, dark brown, brown, or grayish brown. The E horizon is strong brown, brown, yellowish brown, light yellowish brown, pale brown, or brownish yellow. The BA horizon is strong brown or yellowish brown. The Bt horizon is red or yellowish red. The texture is sandy loam or sandy clay loam.

McLaurin Series

The McLaurin series consists of well drained soils on uplands. These soils formed in loamy marine deposits. The slope ranges from 2 to 8 percent. The soils of the McLaurin series are coarse-loamy, siliceous, thermic Typic Paleudults.

McLaurin soils are associated with Lucedale, Lucy, Ruston, and Smithdale soils. They are adjacent to Lucedale, Lucy, and Ruston soils. Lucedale soils are on broad ridgetops. These soils have a fine-loamy control section. Lucy soils are on side slopes. These soils have a sandy surface horizon that is more than 20 inches thick. Ruston soils are on ridges and upper side slopes. These soils have a fine-loamy control section. Smithdale soils are on steeper slopes than McLaurin soils and have a fine-loamy control section.

Typical pedon of McLaurin fine sandy loam, 2 to 5 percent slopes; in a pasture 8.5 miles southeast of Columbia on old Purvis Road, 1.5 miles north on a county road, and 30 feet north of the road; SW1/4SW1/4 sec. 14, T. 3 N., R. 14 E.

Ap—0 to 4 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.
E—4 to 8 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.
Bt1—8 to 23 inches; red (2.5YR 4/6) loam; weak fine and medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; strongly acid; clear wavy boundary.
Bt2—23 to 32 inches; yellowish red (5YR 5/8) sandy loam; weak fine and medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; common medium pockets of pale brown (10YR 6/3) uncoated sand grains; strongly acid; abrupt smooth boundary.
B/E—32 to 42 inches; strong brown (7.5YR 5/8) loamy sand B horizon; weak fine granular structure; very friable; common medium light yellowish brown (10YR 6/4) pockets of uncoated sand grains E horizon; strongly acid; abrupt smooth boundary.
B't—42 to 62 inches; red (2.5YR 4/6) loam; weak fine and medium subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid.

The thickness of the solum is 60 to more than 80 inches. Reaction is very strongly acid or strongly acid throughout.

The Ap or A horizon is very dark grayish brown, dark gray, dark brown, brown, or dark grayish brown. The E horizon is light yellowish brown, yellowish brown, brown, or dark grayish brown. The texture is fine sandy loam, sandy loam, or loamy sand. The Bt horizon is yellowish red, reddish brown, or red. The texture is sandy loam or fine sandy loam. The clay content is 10 to 18 percent. The B/E horizon has colors similar to those of the Bt horizon except that the E material is almost stripped of clay and is reddish yellow, pale brown, or light yellowish brown. This material is in a discontinuous pattern and makes up 10 to 25 percent, by volume, of the horizon. The texture is loamy sand, sandy loam, or fine sandy loam. The B't horizon is red, yellowish red, or reddish brown. The texture is sandy clay loam, sandy loam, or loam.

Nugent Series

The Nugent series consists of excessively drained soils on sandbars and flood plains of the Pearl River. These soils formed in stratified sandy sediment. The slope ranges from 0 to 2 percent. The soils of the Nugent series are sandy, siliceous, thermic Typic Udifluvents.

Nugent soils are associated with Bigbee, Cascilla, and Jena soils. Bigbee soils are on flood plains but are not stratified. Cascilla soils are on natural stream levees. They have a fine-silty control section. Jena soils are on higher elevations than Nugent soils. They have a coarse-loamy control section.

Typical pedon of Nugent sand, frequently flooded; 1.5 miles west of Columbia on U.S. Highway 98, and about 300 feet south of the highway; SW1/4SW1/4 sec. 12, T. 3 N., R. 13 E.

A—0 to 2 inches; pale brown (10YR 6/3) sand; massive; loose; few fine roots; strongly acid; clear smooth boundary.

C1—2 to 10 inches; very pale brown (10YR 7/3) sand; massive; loose; thin strata of brown loamy sand; few fine roots; strongly acid; gradual smooth boundary.

C2—10 to 20 inches; pale brown (10YR 6/3) loamy sand; massive; loose; thin strata of brown fine sandy loam; few fine roots; very strongly acid; gradual smooth boundary.

C3—20 to 26 inches; light yellowish brown (10YR 6/4) loamy sand; few fine pockets of light gray uncoated sand grains; massive; loose; thin strata of yellowish brown fine sandy loam; few fine roots; very strongly acid; abrupt smooth boundary.

C4—26 to 34 inches; yellowish brown (10YR 5/6) fine sandy loam; massive; very friable; very strongly acid; clear smooth boundary.

C5—34 to 48 inches; very pale brown (10YR 7/3) loamy sand; massive; loose; thin strata of brown fine sandy loam; strongly acid; clear smooth boundary.

C6—48 to 62 inches; yellowish brown (10YR 5/4) fine sandy loam; common medium faint pale brown (10YR 6/3) and yellowish brown (10YR 5/6) mottles; massive; very friable; strongly acid.

Reaction is very strongly acid or strongly acid throughout the solum.

The A horizon is brown, dark brown, dark grayish brown, grayish brown, pale brown, or very pale brown. The texture is fine sandy loam, sandy loam, loamy sand, or sand. The C horizon is brown, strong brown, pale brown, very pale brown, light yellowish brown, or yellowish brown. The texture is fine sandy loam, sand, or loamy sand. The texture is dominantly sand or loamy sand in the 10- to 40-inch control section; however, relatively thin horizons of fine sandy loam and thin strata of very fine sandy loam, loam, or silt loam are in some pedons in the control section. If these were mixed, however, the texture would be sand or loamy sand. At a depth of more than 40 inches, it is sand, loamy sand, or fine sandy loam. Coarse fragment content ranges from 0 to 10 percent, by volume. In some pedons, the lower part of the C horizon has thin strata of gravel.

Petal Series

The Petal series consists of moderately well drained soils on rolling or hilly uplands. These soils formed in loamy and clayey marine sediment. The slope ranges from 8 to 20 percent. The soils of the Petal series are fine-loamy, siliceous, thermic Typic Paleudalfs.

Petal soils are associated with Susquehanna soils. Susquehanna soils are adjacent to Petal soils but are in lower positions on the landscape. The Susquehanna soils have 35 to 60 percent of clay in the upper 20 inches of the Bt horizon and have vertic properties.

Typical pedon of Petal sandy loam, in an area of Petal-Susquehanna association, rolling; 13.5 miles southeast of Columbia on State Highway 13, 2.5 miles southwest on a woods road, and 1,200 feet north of the road; SE1/4NW1/4 sec. 26, T. 2 N., R. 17 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary.

E—4 to 10 inches; yellowish brown (10YR 5/4) sandy loam; few fine faint brown mottles; weak fine granular structure; very friable; many fine roots; very strongly acid; abrupt smooth boundary.

Bt1—10 to 16 inches; red (2.5YR 4/8) clay loam; few fine distinct light yellowish brown (10YR 6/4) mottles; moderate medium angular blocky structure; firm; few fine roots; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—16 to 25 inches; red (2.5YR 5/8) clay loam; common medium distinct yellowish brown (10YR 5/6) and light brownish gray (2.5Y 6/2) mottles; moderate medium angular blocky structure; firm; thin patchy clay films on faces of peds; strongly acid; clear wavy boundary.

Bt3—25 to 34 inches; mottled yellowish red (5YR 5/8), red (2.5YR 5/8), brownish yellow (10YR 6/8), and light gray (10YR 7/2) clay loam; moderate medium angular blocky structure; firm; clay films on faces of peds; few fine quartz pebbles; strongly acid; gradual wavy boundary.

Bt4—34 to 40 inches; mottled light gray (10YR 7/2), yellowish brown (10YR 5/8), and red (2.5YR 4/8) clay loam; moderate fine and medium angular blocky structure; firm; clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt5—40 to 54 inches; mottled light gray (5Y 7/2), light yellowish brown (10YR 6/4), brownish yellow (10YR 6/8), and red (2.5YR 4/8) clay loam; moderate fine

and medium angular blocky structure; firm; clay films on faces of peds; few fine and medium quartz pebbles; very strongly acid; clear smooth boundary.

Btg—54 to 65 inches; light gray (5Y 7/2) clay loam; few fine distinct yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) mottles; moderate fine and medium angular blocky structure; firm, plastic and sticky; clay films on face of peds; very strongly acid.

The thickness of the solum is 60 to more than 80 inches. Reaction is very strongly acid or strongly acid throughout.

The A horizon is dark grayish brown, grayish brown, or brown. The E horizon is pale brown, light yellowish brown, yellowish brown, or brown. The upper part of the Bt horizon is strong brown, yellowish red, or red. Some pedons have a few mottles in shades of brown or gray. In the upper 20 inches of the Bt horizon, the clay content ranges from 20 to 35 percent. The texture is loam, clay loam, or sandy clay loam. The lower part of the Bt horizon is mottled in shades of gray, brown, and red, or it has matrix colors of pale brown, gray, light gray, and light grayish brown. The texture is clay loam, silty clay loam, silty clay, or clay.

Prentiss Series

The Prentiss series consists of moderately well drained soils on stream terraces. These soils have a fragipan. They formed in loamy material. The slope ranges from 0 to 2 percent. The soils of the Prentiss series are coarse-loamy, siliceous, thermic Glossic Fragiudults.

Prentiss soils are associated with Cahaba, Latonia, and Stough soils. Cahaba soils are on stream terraces. They have a Bt horizon that has hue of 5YR to 10R. These soils have a fine-loamy control section and do not have a fragipan. Latonia soils are on stream terraces. These soils have a solum that is less than 45 inches thick, and they do not have a fragipan. Stough soils are in lower positions on the landscape than Prentiss soils and are somewhat poorly drained.

Typical pedon of Prentiss fine sandy loam, 0 to 2 percent slopes; in a woodland 9 miles north of Columbia on State Highway 35, 0.3 mile east on a county road, and about 600 feet north of the road; NE1/4SE1/4 sec. 22, T. 5 N., R. 18 W.

A1—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

A2—3 to 8 inches; brown (10YR 4/3) fine sandy loam; few fine faint pale brown and dark yellowish brown mottles; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

Bw1—8 to 19 inches; yellowish brown (10YR 5/6) sandy loam; few fine faint light yellowish brown and dark yellowish brown mottles; weak fine and medium subangular structure; friable; many fine roots; sand grains coated and bridged with clay; strongly acid; clear smooth boundary.

Bw2—19 to 25 inches; brownish yellow (10YR 6/6) loam; few fine distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few pockets of uncoated sand grains; few fine roots; very strongly acid; abrupt smooth boundary.

Btx1—25 to 36 inches; mottled brownish yellow (10YR 6/6), strong brown (7.5YR 5/6), yellowish brown (10YR 5/6), and light brownish gray (10YR 6/2) loam; weak very coarse prismatic parting to moderate medium subangular blocky structure; firm and compact; brittle in more than 70 percent of the volume; common fine voids; patchy clay films on faces of peds; very strongly acid; clear wavy boundary.

Btx2—36 to 50 inches; mottled light gray (10YR 7/2), strong brown (7.5YR 4/6) and (7.5YR 5/8), and yellowish brown (10YR 5/6) loam; weak very coarse prismatic parting to weak medium subangular blocky structure; firm and compact; brittle in more than 70 percent of the volume; common fine voids; patchy clay films on faces of peds; very strongly acid, clear wavy boundary.

Btx3—50 to 65 inches; mottled yellowish brown (10YR 5/6), light gray (10YR 7/1), strong brown (7.5YR 5/8), and dark yellowish brown (10YR 4/4) loam; weak very coarse prismatic parting to weak medium subangular blocky structure; firm and compact; brittle in more than 60 percent of the volume; few fine voids; patchy clay films on faces of peds; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is very strongly acid or strongly acid throughout except where the surface layer has been limed.

The A horizon is dark grayish brown, grayish brown, brown, or dark brown. The Ap horizon, if present, includes these same colors, and also can include yellowish brown. The Bw horizon is pale brown, light yellowish brown, or yellowish brown. The texture is loam, fine sandy loam, or sandy loam. The Btx horizon has matrix colors similar to those in the Bw horizon or is mottled in shades of yellow, brown, gray, and red. The texture is loam, sandy loam, or fine sandy loam. The clay content, by weighted average, between a depth of 10 inches and the top of the Btx horizon, is 12 to 18 percent.

Ruston Series

The Ruston series consists of well drained soils on uplands. These soils formed in loamy marine sediment. The slope ranges from 2 to 8 percent. The soils of the Ruston series are fine-loamy, siliceous, thermic Typic Paleudults.

Ruston soils are associated with Lucedale, McLaurin, and Smithdale soils. Lucedale soils are on broad, nearly level uplands. They are redder than Ruston soils. McLaurin soils are adjacent to Ruston soils on ridges and side slopes. McLaurin soils have a coarse-loamy control section. Smithdale soils are on steep side slopes on uplands.

Typical pedon of Ruston sandy loam, 2 to 5 percent slopes; in a pasture 4.75 miles east of Columbia on U.S. Highway 98, 0.5 mile southeast on a county road, and 20 feet south of the road; SE1/4NW1/4 sec. 6, T. 3 N., R. 17 W.

Ap—0 to 6 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

Bt—6 to 29 inches; red (2.5YR 4/6) sandy clay loam; moderate fine and medium subangular blocky structure; friable; many fine roots; sand grains coated and bridged with clay; strongly acid; clear smooth boundary.

B/E—29 to 43 inches; yellowish red (5YR 4/6) fine sandy loam B horizon; weak fine subangular blocky structure; friable; few fine roots; pockets of light yellowish brown (10YR 6/4) sandy loam E horizon; sand grains coated with clay and oxides; mottled areas of uncoated sand; strongly acid; clear wavy boundary.

B't—43 to 62 inches; red (2.5YR 4/8) sandy clay loam; moderate medium subangular blocky structure; friable; patchy clay film on faces of peds; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is very strongly acid or strongly acid throughout.

The A horizon is dark grayish brown, pale brown, light yellowish brown, brown, yellowish brown, or dark brown. The Bt horizon is red or yellowish red. The texture is sandy clay loam, fine sandy loam, loam, or clay loam. In the upper 20 inches of the Bt horizon, the clay content is 18 to 30 percent. The E horizon, if present, occurs as streaks and pockets in shades of brown with none to many uncoated sand grains. The B't horizon has colors similar to those of the Bt horizon. It ranges from none to many mottles in shades of brown, red, or gray, or it is mottled in these colors.

Saffell Series

The Saffell series consists of well drained soils on uplands. These soils formed in loamy and gravelly sediment. The slope ranges from 5 to 40 percent. The soils of the Saffell series are loamy-skeletal, siliceous, thermic Typic Hapludults.

Saffell soils are associated with Lucy and Smithdale soils. Lucy soils are adjacent to Saffell soils on hillsides. Lucy soils have a sandy A horizon that is 20 to 40 inches thick. Smithdale soils are in similar positions as Saffell soils on uplands. Smithdale soils have a fine-loamy control section. These soils have a solum that is 60 inches or more thick.

Typical pedon of Saffell gravelly sandy loam, 8 to 40 percent slopes; in a woodland about 2.5 miles east of Columbia on old U.S. Highway 98, and 200 feet south of the road; SE1/4NE1/4 sec. 3, T. 3 N., R. 18 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) gravelly sandy loam; weak fine granular structure; very friable; many fine and medium roots; about 20 percent, by volume, of pebbles; strongly acid; clear smooth boundary.

AB—5 to 11 inches; yellowish brown (10YR 5/4) gravelly sandy loam; weak fine granular structure; very friable; many fine and medium roots; 20 percent, by volume, of gravel; strongly acid; abrupt smooth boundary.

Bt—11 to 24 inches; red (2.5YR 4/6) very gravelly sandy clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; clay films on ped faces; about 35 percent, by volume, of pebbles; strongly acid; clear wavy boundary.

BC—24 to 48 inches; yellowish red (5YR 5/8) very gravelly fine sandy loam; common medium distinct red (2.5YR 4/8) mottles; weak fine subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; about 50 percent, by volume, of pebbles; strongly acid; gradual wavy boundary.

C—48 to 80 inches; yellowish red (5YR 5/8) gravelly loamy sand; massive; very friable; about 25 percent, by volume, of quartz gravel; strongly acid.

The thickness of the solum is 35 to 60 inches. Reaction is very strongly or strongly acid except where the A horizon has been limed. The gravel content in the B horizon varies from 35 to 60 percent, by volume.

The A horizon is dark grayish brown or brown. The texture is sandy loam or gravelly sandy loam. The E horizon, if present, is brown or yellowish brown. The texture is sandy loam or gravelly sandy loam. The AB horizon is brown, dark yellowish brown, or yellowish brown. The Bt horizon is red, yellowish red, reddish brown, or strong brown. The texture is very gravelly loam, very gravelly fine sandy loam, or very gravelly

sandy clay loam. The BC horizon and C horizon have the same colors as those in the Bt horizon. The texture is a gravelly sandy loam, gravelly loamy sand, very gravelly sandy loam, or very gravelly loamy sand.

Savannah Series

The Savannah series consists of moderately well drained soils on stream terraces and uplands. These soils have a fragipan. They formed in loamy material. The slope ranges from 0 to 8 percent. The soils of the Savannah series are fine-loamy, siliceous, thermic Typic Fragiudults.

Savannah soils are associated with Falkner, Latonia, and Stough soils. Falkner soils are in similar positions on uplands as the Savannah soils. The Falkner soils have a fine-silty control section. Latonia soils are adjacent to Savannah soils on stream terraces, but Latonia soils do not have a fragipan. Stough soils are adjacent to Savannah soils but are in lower positions on the landscape. Stough soils are somewhat poorly drained.

Typical pedon of Savannah fine sandy loam, 2 to 5 percent slopes; in a pasture 2.5 miles north of Columbia on old State Highway 35, 0.4 mile west on a county road, and 20 feet north of the road; NW1/4NE1/4 sec. 29, T. 4 N., R. 18 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; few fine roots; strongly acid; abrupt smooth boundary.

E—6 to 10 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; few fine roots; strongly acid; clear smooth boundary.

Bt—10 to 26 inches; yellowish brown (10YR 5/8) loam; few fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; abrupt smooth boundary.

Btx1—26 to 42 inches; mottled yellowish brown (10YR 5/8), strong brown (7.5YR 5/8), and light brownish gray (10YR 6/2) sandy loam; weak very coarse prismatic parting to moderate medium subangular blocky structure; firm and compact; brittle in about 60 percent of volume; sand grains coated and bridged with clay; common fine voids; strongly acid; gradual wavy boundary.

Btx2—42 to 54 inches; mottled yellowish brown (10YR 5/8), yellowish red (5YR 5/8), and light brownish gray (10YR 6/2) sandy loam; weak very coarse prismatic parting to moderate medium subangular blocky structure; firm and compact; brittle in about 60 percent of volume; sand grains coated and bridged with clay; patchy clay films on faces of peds; common fine voids; uncoated sand grains in seams between prisms; strongly acid; gradual wavy boundary.

Btx3—54 to 70 inches; mottled brownish yellow (10YR 6/8), light gray (10YR 7/1), and red (2.5YR 4/8) sandy loam; weak very coarse prismatic parting to moderate medium subangular and angular blocky structure; firm and compact; brittle in about 60 percent of volume; patchy clay films on faces of peds; common fine voids; uncoated sand grains in seams between prisms; strongly acid.

The thickness of the solum is 60 inches to more than 80 inches. Reaction is very strongly acid or strongly acid throughout. Depth to the fragipan is 16 to 38 inches.

The A horizon and the E horizon are dark grayish brown, yellowish brown, or brown. The Bt horizon is yellowish brown or strong brown. The texture is loam or sandy clay loam. The Bt horizon ranges from 18 to 30 percent clay in the upper 20 inches. The Btx horizon is mottled in shades of brown, yellow, gray and red, or it has a yellowish brown matrix color mottled in shades of gray. The texture is loam, sandy clay loam, or clay loam.

Smithdale Series

The Smithdale series consists of well drained soils on hilly uplands. These soils formed in loamy marine sediment. The slope ranges from 5 to 40 percent. The soils of the Smithdale series are fine-loamy, siliceous, thermic Typic Hapludults.

Smithdale soils are associated with Lucy, McLaurin, Ruston, and Saffell soils. Lucy soils are on ridges and hillsides. They have a sandy A horizon 20 to 40 inches thick. McLaurin soils have a coarse-loamy control section. Ruston soils have more clay in the lower part of the B horizon. The slope is less than 8 percent. Saffell soils are adjacent to Smithdale soils on hillsides. Saffell soils have 35 to 60 percent, by volume, of gravel in the B horizon.

Typical pedon of Smithdale sandy loam, 15 to 35 percent slopes; in a woodland 7.5 miles west of Columbia on U.S. Highway 98, 0.5 mile north on a county road, and 100 feet east of the road; NE1/4SE1/4 sec. 23, T. 3 N., R. 12 E.

A—0 to 6 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

E—6 to 12 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; many fine and medium roots; some mixing of A horizon material by worm activity; strongly acid; clear smooth boundary.

Bt1—12 to 24 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; many fine roots; clay films on faces of peds; strongly acid; clear wavy boundary.

Bt2—24 to 36 inches; red (2.5YR 4/6) loam; few fine distinct strong brown (7.5YR 5/8) mottles; weak medium and fine subangular blocky structure; friable; few fine roots; clay films on faces of peds; strongly acid; clear wavy boundary.

Bt3—36 to 65 inches; red (2.5YR 5/8) sandy loam; few fine distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; common coarse pockets of uncoated sand grains; strongly acid; clear wavy boundary.

Bt4—65 to 84 inches; red (2.5YR 4/8) sandy loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; common coarse brownish yellow pockets of uncoated sand grains; strongly acid.

The thickness of the solum is more than 60 inches. Reaction is very strongly acid or strongly acid throughout.

The A horizon is dark gray, brown, or dark grayish brown. The E horizon, if present, is brown, pale brown, grayish brown, yellowish brown, or light yellowish brown. The texture is sandy loam or fine sandy loam. Some pedons have a thin strong brown, dark brown, or yellowish red BA horizon or BE horizon. The upper part of the Bt horizon is red or yellowish red. The texture is clay loam, loam, or sandy clay loam. The upper 20 inches of the Bt horizon is 18 to 33 percent clay. The lower part of the Bt horizon has colors similar to those of the upper part of the Bt horizon and has few to many pockets of uncoated sand grains. The texture is loam or sandy loam.

Stough Series

The Stough series consists of somewhat poorly drained soils on upland flats and stream terraces. These soils formed in loamy material. The slope ranges from 0 to 2 percent. The soils of the Stough series are coarse-loamy, siliceous, thermic Fragiaquic Paleudults.

Stough soils are associated with Cahaba, Guyton, Prentiss, and Savannah soils. Cahaba soils are in higher positions on the landscape than Stough soils. These Cahaba soils are well drained and have a fine-loamy control section. Guyton soils are in drainageways. They are poorly drained and have a fine-silty control section. Prentiss soils are on nearly level ridges. These soils are moderately well drained, and they have a fragipan. Savannah soils are in higher positions than Stough soils on broad, nearly and gently sloping ridges. Savannah soils have a fine-loamy control section, and they have a fragipan.

Typical pedon of Stough fine sandy loam, 0 to 2 percent slopes; in a pasture 2 miles southeast of Columbia on old Purvis Road, about 0.4 mile south of the road; SW1/4NW1/4 sec. 10, T. 3 N., R. 18 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

B/E—8 to 16 inches; light yellowish brown (2.5Y 6/4) B horizon, if present, and few fine distinct light brownish gray (10YR 6/2) sandy loam E horizon, if present; few fine faint yellowish brown mottles; weak fine and medium subangular blocky structure; friable; many fine roots; few patchy clay films on faces of peds; strongly acid; clear smooth boundary.

Bt—16 to 24 inches; mottled brownish yellow (10YR 6/6), strong brown (7.5YR 5/8), and light brownish gray (10YR 6/2) fine sandy loam; weak fine subangular blocky structure; friable; few fine roots; few patchy clay films on faces of peds; strongly acid; clear wavy boundary.

Btx1—24 to 34 inches; mottled strong brown (7.5YR 5/8), yellowish brown (10YR 5/6), and light brownish gray (10YR 6/2) fine sandy loam; weak medium prismatic structure parting to weak medium subangular blocky; firm and slightly compact; brittle in about 50 percent of the volume; patchy clay films on faces of peds; gray seams of fine sandy loam 1/2 inch wide between prisms; strongly acid; clear irregular boundary.

Btx2—34 to 50 inches; mottled strong brown (7YR 5/8), light brownish gray (10YR 6/2), and brownish yellow (10YR 6/6) sandy loam; weak medium prismatic structure parting to weak medium subangular blocky; firm and slightly compact; brittle in about 50 percent of the volume; patchy clay films on faces of peds; gray seams of fine sandy loam 1/2 inch wide between prisms; strongly acid; clear irregular boundary.

Btx3—50 to 62 inches; mottled yellowish brown (10YR 5/8), light brownish gray (2.5Y 6/2), and strong brown (7.5YR 5/8) loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm and slightly compact; brittle in about 50 percent of the volume; patchy clay films on faces of peds; gray seams of sandy loam 1/2 inch wide between prisms; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is very strongly acid or strongly acid throughout.

The Ap horizon is light yellowish brown, grayish brown, or dark grayish brown. An E horizon, if present, is pale brown or light yellowish brown. The texture is fine sandy loam or loam. The B/E horizon is yellowish brown, light yellowish brown, light brownish gray, or light olive brown. The Bt horizon is pale brown, light yellowish brown, yellowish brown, or it is mottled in shades of yellow, brown, and gray. The lower part of the Btx horizon is mottled in shades of brown and gray. The texture is fine sandy loam, sandy loam, or loam. The Btx horizon is

compact and brittle. Plant growth is restricted in about 40 to 55 percent of the volume of the horizon. This part of the horizon is more brown in color.

Susquehanna Series

The Susquehanna series consists of somewhat poorly drained soils on uplands. These soils formed in clayey marine sediment. The slope ranges from 2 to 10 percent. The soils of the Susquehanna series are fine, montmorillonitic, thermic Vertic Paleudulfs.

Susquehanna soils are associated with Benndale, Falkner, and Petal soils. Benndale soils are in similar upland areas as Susquehanna soils. Benndale soils have a coarse-loamy control section. Falkner soils are on broad, nearly level to gently sloping uplands. The upper part of the Bt horizon in Falkner soils is silty. Petal soils are adjacent to Susquehanna soils but are in higher positions on the landscape. The Petal soils do not have vertic properties.

Typical pedon of Susquehanna fine sandy loam, in an area of Petal-Susquehanna association, rolling; 17.5 miles southeast of Columbia on State Highway 13, 2.3 miles south on a woods road, and 200 feet north of the road; SE1/4SE1/4 sec. 26, T. 2 N., R. 17 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; few fine roots; very strongly acid; clear smooth boundary.

E—4 to 9 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; very friable; many fine roots; very strongly acid; abrupt smooth boundary.

Bt1—9 to 16 inches; red (2.5YR 4/8) clay; few fine faint red mottles; moderate medium angular blocky structure; firm, very plastic and very sticky; few fine roots; shiny grooved faces on peds; very strongly acid; clear wavy boundary.

Bt2—16 to 28 inches; red (2.5YR 5/8) clay; few fine distinct red (2.5YR 4/8) and light brownish gray (10YR 6/2) mottles; moderate medium angular blocky structure; firm, very sticky and very plastic; shiny grooved faces on peds; few slickensides; very strongly acid; abrupt smooth boundary.

Bt3—28 to 36 inches; mottled light brownish gray (2.5Y 6/2), yellowish red (5YR 5/6), and red (10R 4/8) clay; moderate medium angular blocky structure; firm, very sticky and very plastic; shiny grooved faces on peds; very strongly acid; clear wavy boundary.

Bt4—36 to 52 inches; mottled light gray (5Y 7/2), reddish yellow (7.5YR 6/8), and red (10R 4/8) clay; moderate medium angular blocky structure; firm, very sticky and very plastic; shiny grooved faces on peds; very strongly acid; clear wavy boundary.

Bt5—52 to 62 inches; light gray (5Y 7/2) clay; common medium prominent red (10R 5/6), few fine distinct strong brown (7.5YR 5/8), and few fine faint pale olive mottles; moderate medium angular blocky structure; firm, very sticky and very plastic; shiny grooved faces on peds; very strongly acid.

The solum is more than 60 inches thick, and the argillic horizon is more than 50 inches thick. Reaction is very strongly acid or strongly acid throughout.

The A horizon is dark grayish brown, grayish brown, or dark gray. The texture is loam, fine sandy loam, sandy loam, or silt loam. The E horizon is dark yellowish brown, brown, yellowish brown, or brownish yellow. The texture is loam, fine sandy loam, sandy loam, or silt loam. The upper part of the Bt horizon is red, yellowish red, or strong brown. Few to many mottles that have chroma of 2 or less are in the upper 10 inches, or the horizon is mottled in shades of gray, red, and yellow. The lower part of the Bt horizon has gray matrix colors or is mottled in shades of gray, red, brown, or yellow. The Bt horizon is silty clay loam, clay loam, silty clay, or clay. The clay content ranges from 35 to 60 percent in the upper 20 inches of the Bt horizon.

Formation of the Soils

In this section the factors of soil formation are discussed as they relate to the soils of Marion County. In addition, the processes of soil formation are described.

Factors of Soil Formation

Soil is the product of the combined effects of parent material, climate, plant and animal life, relief, and time *(14)*. The characteristics of a soil at any place depend upon a combination of these five environmental factors at that particular place. These factors affect the formation of every soil. In many places, however, one or two of the factors are dominant and fix most of the properties of a particular soil.

Parent Material

Parent material is the unconsolidated geologic material in which a soil forms. It largely determines the chemical and mineral composition of a soil *(4)*. Most of the soils in Marion County formed in unconsolidated beds of fine textured to coarse textured Coastal Plain sediments. Some soils formed in alluvium; others formed in deposits of highly decomposed plant remains in drainageways and on flood plains.

The bright-colored soils of Marion County formed in material that, during the period of soil development, was above the ground water level and was subjected to the influence of water percolating downward from the surface. The grayish colored soils are in low, flat areas where the water table is high and the drainage is poor.

Soils that formed from Coastal Plain sediments are throughout the county. These sediments consist of sand, silt, and clay. Slopes are nearly level through steep.

Soils that formed in alluvium, washed from upland soils, are along the larger streams. They are dominantly of sandy texture. Soils on first bottoms have a weakly defined profile because floodwaters still deposit fresh soil material.

Soils that formed in organic materials are in drainageways and on flood plains under forest vegetation. A water table at the surface or near the surface almost continuously retards decomposition of the vegetation, which is still actively depositing organic material in these areas. These areas are flooded most of the year.

Climate

The warm, moist climate of Marion County has favored rapid development of soils. Warm temperatures accelerate the growth of many kinds of organisms. Chemical reactions are more rapid, and the relatively high precipitation leaches the soluble material, such as bases, and accelerates the translocation of less soluble material, such as colloidal matter, downward through the profile. As a result, the soils are strongly leached and have strongly expressed horizons in which the effects of other soil-forming factors are not easy to see. For more information about the climate of Marion County, see the section "General Nature of the County."

Plant and Animal Life

Plants, animals, and micro-organisms that live on and in the soil are important in the formation of soils. Bacteria, fungi, and other micro-organisms help to weather rock and decompose organic matter. They are mostly in the uppermost few inches of the soil. Earthworms and other small invertebrates are mostly in the surface layer. Crawfish dig into the subsoil of the wetter soils. Together, they continually mix the soil material. Plants alter the soil microclimate, supply organic matter, and transfer minerals from the subsoil to the surface layer.

The native vegetation of the well drained uplands was mainly longleaf pine and slash pine. Native vegetation, on the broad, wet flats, was mainly loblolly pine, slash pine, sweetgum, and sweet bay. On the better drained bottom land, it was mainly loblolly pine, slash pine, spruce pine, oak, magnolia, holly, and beech. The native vegetation in old sloughs and depressions included tupelo, gum, cypress, bay, and magnolia trees.

Relief

Relief affects soil formation through its influence on drainage, erosion, plant cover, and soil temperature. The relief in Marion County is nearly level to steep. Most of the nearly level land is on flood plains or stream terraces. Relief in Marion County is of such low intensity that differences in microclimate are not of great importance. Soils on many hillsides are not much different from those on ridgetops. The Pearl River moves through the central part of Marion County from the north to the south. The uplands rise in elevation as they

extend away from the river basin to the east and to the west.

The uplands in the county are a series of ridges. The relief is greater on soils on uplands, and the streams have developed definite valleys. The soils on the uplands have more clearly expressed horizons than those on the flood plains. The steep soils generally are between the ridgetops and the flood plains. More runoff has generally resulted in less horizon development in the soils on the hillsides than in soils on ridgetops.

The soils at the base of slopes, in draws, and in depressions have more organic matter in the surface layer and have been affected less by iron oxidation and by translocation of silicate clay minerals than have the associated soils on the ridgetops and hillsides.

Time

Time is necessary for the development of soils from parent material. A long time generally is required for the formation of distinct horizons in soils. The length of time required for a mature soil to develop depends largely on the other factors of soil formation. Young soils have a weakly developed profile and retain most of the chracteristics of the parent material except for the darkening of the surface layer. Old soils have well defined horizons that are far different from the parent material from which they developed.

Processes of Horizon Formation

Several processes were involved in the formation of horizons in the soils of Marion County. These processes are the accumulation of organic matter; the leaching of calcium carbonates and bases; the liberation, reduction, and transfer of iron; and the formation and translocation of silicate clay minerals. In most soils more than one of these processes have been active in the development of horizons.

The accumulation of organic matter in the upper part of the soil profile contributes to the formation of an A horizon. The soils in Marion County have low organic matter content on well drained uplands to very high organic matter content in drainageways and on flood plains.

Carbonates and bases have been leached from nearly all the soils. Most of the soils are moderately to strongly leached. Leaching of bases from the upper horizons of a soil commonly precedes the translocation of silicate clay.

Translocation of silicate clay has occurred in many of the soils. Translocation of clay minerals contributes to the development of an eluviated E horizon that contains less clay and is generally lighter in color than the B horizon. The B horizon commonly has clay accumulated in films, in pores, and on the surface of peds. Falkner soils, for example, have films of translocated clay in the B horizon.

Reduction, segregation, and transfer of iron, a process called gleying, is evident in the poorly drained soils of the county. Reduction and loss of iron are indicated by gray colors in the subsoil. Segregation of iron is indicated by reddish or brownish mottles and concretions.

References

(1) American Association of State Highway [and Transportation] Officials. 1970. Standard specifications for highway materials and methods of sampling and testing. Ed. I0, 2 vol., illus.

(2) American Society for Testing and Materials. 1974. Method for classification of soils for engineering purposes. ASTM Stand. D 2487-69. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.

(3) Bicker, Alvin R., Jr. 1969. Geologic map of Mississippi. Mississippi Geol. Survey.

(4) Brown, Glen Francis, V. M. Foster, R. W. Adams, E. W. Reed, and D. H. Padgell, Jr. 1944. Geology and ground-water resources of the coastal area in Mississippi. Mississippi Geol. Surv. Bull. 60, 166 pp., illus.

(5) Childress, Sarah Conner. 1973. Mississippi geologic names. Mississippi Geol. Survey Bull. 118, 172 pp.

(6) Day, Paul R. and others. 1956. Report of the committee on physical analysis, 1954-1955. Soil Sci. Soc. Am. Proc. 20: 167-169.

(7) Harsch, Jeanne H., compiler. 1982. Mississippi agricultural statistics 1980-1981. *In* Mississippi Crop and Livestock Reporting Service Sup. No. 16, 60 pp., illus.

(8) Marion County Historical Society. 1976. History of Marion County, Mississippi. 1st edition. Walsworth Publishing Co., Inc., Marceline, Mo. 198 pp., illus.

(9) Moon, J. W., in charge, and Clarence Lounsbury, Robert Wildermuth, C. S. Simmons, Arthur E. Taylor, and Z. C. Foster. 1938. Soil survey of Marion County, Mississippi. U.S. Dep. of Agric., Bur. of Chem. and Soils, in cooperation with the Mississippi Geol. Surv., Washington, D.C. Series 1934, No. 6, 40 pp., illus.

(10) Priddy, Richard Randall. 1967. Physiographic map of Mississippi. *In* George County Geology and Mineral Resources Bull. 108, 226 pp., illus. Mississippi Geol. Survey.

(11) Rand McNally Commercial Atlas and Marketing Guide. 1983. 114th edition. 583 pp., illus.

(12) Rowland, Dunbar. 1925. History of Mississippi, heart of the south. Vol. I. S. J. Clark Publishing, Chicago, Ill., and Jackson, Miss. 933 pp., illus.

(13) Tippin, Tom, editor. 1978. Proceedings: A symposium on principles of maintaining productivity on prepared sites. Southern Forest Exp. Stn. and U.S. Forest Service SE S&PF. 171 pp., illus.

(14) United States Department of Agriculture. 1938. Soils and men. U.S. Dep. Agric. Yearb., 1232 pp., illus.

(15) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus. [Supplements replacing pp. 173-188 issued May 1962.]

(16) United States Department of Agriculture. 1972. Soil survey laboratory methods and procedures for collecting soil samples. Soil Surv. Invest. Rep. 1, 63 pp., illus.

(17) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436, 754 pp., illus.

(18) United States Department of Agriculture. 1978. Forest statistics for Mississippi counties. Forest Serv., South. Forest Exp. Stn. Resour. Bull. SO-69, 86 pp.

Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Broad-base terrace. A ridge-type terrace built to control erosion by diverting runoff along the contour at a nonscouring velocity. The terrace is 10 to 20 inches high and 15 to 30 feet wide and has gently sloping sides, a rounded crown, and a dish-shaped channel along the upper side. It may be nearly level or have a grade toward one or both ends.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.
Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazingland for a prescribed period.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy

material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual.* The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from

that in the solum, the Arabic numeral 2 precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor filter (in tables). Because of rapid permeability the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when the soil is dry and the swelling when it is wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05

millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to insure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining or other excavating.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Based on data recorded in the period 1951-80 at Columbia, Mississippi]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	61.0	37.9	49.5	80	14	154	5.44	2.88	7.68	8	.2
February---	65.1	40.1	52.6	83	18	178	5.66	2.68	8.22	7	.0
March------	72.1	46.6	59.4	87	24	312	5.96	2.72	8.73	8	.0
April------	79.8	54.6	67.2	90	35	516	5.73	2.52	8.47	6	.0
May--------	85.5	61.4	73.5	95	43	729	5.07	2.23	7.48	6	.0
June-------	91.7	67.6	79.7	100	53	891	4.18	1.99	6.06	7	.0
July-------	93.0	70.7	81.9	100	63	989	5.32	3.34	7.11	10	.0
August-----	92.5	69.7	81.1	100	59	964	5.10	2.52	7.34	8	.0
September--	88.3	65.5	76.9	97	48	807	4.09	1.64	6.14	6	.0
October----	80.1	52.7	66.4	93	31	508	2.86	.73	4.58	4	.0
November---	70.1	44.2	57.2	86	22	238	4.45	2.12	6.46	6	.0
December---	63.6	39.5	51.6	82	17	136	6.30	3.36	8.88	8	.0
Yearly:											
Average--	78.6	54.2	66.4	---	---	---	---	---	---	---	---
Extreme--	---	---	---	101	13	---	---	---	---	---	---
Total----	---	---	---	---	---	6,422	60.16	49.00	70.77	84	.2

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 °F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Based on data recorded in the period 1951-80 at Columbia, Mississippi]

Probability	Temperature		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 14	March 28	April 5
2 years in 10 later than--	March 2	March 18	March 31
5 years in 10 later than--	February 7	February 26	March 21
First freezing temperature in fall:			
1 year in 10 earlier than--	November 13	October 29	October 21
2 years in 10 earlier than--	November 21	November 5	October 25
5 years in 10 earlier than--	December 5	November 18	November 4

TABLE 3.--GROWING SEASON

[Based on data recorded in the period 1951-80 at Columbia, Mississippi]

Probability	Daily minimum temperature during growing season		
	Higher than 24°F	Higher than 28°F	Higher than 32°F
	Days	Days	Days
9 years in 10	260	230	210
8 years in 10	273	242	216
5 years in 10	299	265	227
2 years in 10	325	288	238
1 year in 10	342	300	244

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
BaA	Bassfield sandy loam, 0 to 2 percent slopes	2,952	0.8
Bb	Bibb silt loam, frequently flooded	10,118	2.9
CaA	Cahaba fine sandy loam, 0 to 2 percent slopes	10,211	2.9
Cb	Cascilla silt loam, frequently flooded	980	0.3
CC	Cascilla-Chenneby association, frequently flooded	16,547	4.7
DC	Dorovan-Croatan association, frequently flooded	1,275	0.4
FaB	Falkner silt loam, 2 to 5 percent slopes	2,948	0.8
FaC	Falkner silt loam, 5 to 8 percent slopes	2,345	0.7
FB	Falkner-Benndale association, undulating	14,750	4.2
Gu	Guyton silt loam, frequently flooded	3,620	1.0
Je	Jena fine sandy loam, frequently flooded	11,415	3.2
Jg	Jena-Bigbee complex, frequently flooded	4,738	1.3
JN	Jena-Nugent association, frequently flooded	8,633	2.5
Jt	Johnston-Croatan complex, frequently flooded	2,420	0.7
LaA	Latonia sandy loam, 0 to 2 percent slopes	14,314	4.1
LuA	Lucedale loam, 0 to 2 percent slopes	560	0.2
MnB	McLaurin fine sandy loam, 2 to 5 percent slopes	1,745	0.5
MnC	McLaurin fine sandy loam, 5 to 8 percent slopes	810	0.2
Ng	Nugent sand, frequently flooded	2,160	0.6
PS	Petal-Susquehanna association, rolling	18,678	5.3
Pt	Pits-Udorthents complex	920	0.3
PxA	Prentiss fine sandy loam, 0 to 2 percent slopes	7,155	2.0
RuB	Ruston sandy loam, 2 to 5 percent slopes	37,220	10.5
RuC	Ruston sandy loam, 5 to 8 percent slopes	10,870	3.1
SaF	Saffell gravelly sandy loam, 8 to 40 percent slopes	1,715	0.5
ShA	Savannah fine sandy loam, 0 to 2 percent slopes	8,160	2.3
ShB	Savannah fine sandy loam, 2 to 5 percent slopes	23,282	6.6
ShC	Savannah fine sandy loam, 5 to 8 percent slopes	7,268	2.1
SkE	Smithdale sandy loam, 8 to 15 percent slopes	10,698	3.1
SkF	Smithdale sandy loam, 15 to 35 percent slopes	44,840	12.7
SL	Smithdale-Lucy association, hilly	24,024	6.8
SS	Smithdale-Saffell-Lucy association, hilly	24,304	6.9
StA	Stough fine sandy loam, 0 to 2 percent slopes	9,905	2.8
	Water	10,420	3.0
	Total	352,000	100.0

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicat
the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability	Corn	Soybeans	Bahiagrass	Improved bermudagrass	Tall f
		Bu	Bu	AUM*	AUM*	AU
BaA------------------------ Bassfield	IIs	75	30	8.5	10.0	
Bb------------------------- Bibb	Vw	---	---	---	8.0	
CaA------------------------ Cahaba	I	100	35	8.5	10.0	
Cb------------------------- Cascilla	IVw	---	---	---	8.0	
CC:						
Cascilla------------------	IVw	---	---	---	8.0	
Chenneby------------------	IVw	---	---	---	9	
DC:						
Dorovan-------------------	VIIw	---	---	---	---	
Croatan-------------------	VIIw	---	---	---	---	
FaB------------------------ Falkner	IIIe	70	30	8.5	9.0	
FaC------------------------ Falkner	IVe	65	25	8.0	8.0	
FB:						
Falkner-------------------	IIIe	70	30	8.5	9.0	
Benndale------------------	IIe	75	30	8.5	10.5	
Gu------------------------- Guyton	Vw	---	---	---	---	
Je------------------------- Jena	Vw	---	---	---	---	
Jg------------------------- Jena-Bigbee	Vw	---	---	---	---	
JN:						
Jena----------------------	Vw	---	---	---	---	
Nugent--------------------	Vw	---	---	---	---	
Jt------------------------- Johnston-Croatan	VIIw	---	---	---	---	

See footnote at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Bahiagrass	Improved bermudagrass	Tall f
		Bu	Bu	AUM*	AUM*	AU
LaA----------------------- Latonia	IIs	60	25	8.5	9.5	
LuA----------------------- Lucedale	I	80	40	10.0	10.0	
MnB----------------------- McLaurin	IIe	75	25	8.0	10.0	
MnC----------------------- McLaurin	IIIe	70	25	7.0	8.5	
Ng------------------------ Nugent	Vw	---	---	---	---	
PS:						
Petal---------------------	VIe	---	---	5.0	5.5	
Susquehanna---------------	VIe	---	---	5.5	6.0	
Pt------------------------ Pits-Udorthents	---	---	---	---	---	
PxA----------------------- Prentiss	IIw	85	30	9.0	9.0	
RuB----------------------- Ruston	IIe	70	30	9.5	12.0	
RuC----------------------- Ruston	IIIe	65	25	9.5	12.0	
SaF----------------------- Saffell	VIIe	---	---	4.0	4.0	
ShA----------------------- Savannah	IIw	80	35	9.0	8.5	
ShB----------------------- Savannah	IIe	75	35	9.0	8.5	
ShC----------------------- Savannah	IIIe	70	30	9.0	8.0	
SkE----------------------- Smithdale	VIe	---	---	5.5	7.0	
SkF----------------------- Smithdale	VIIe	---	---	---	---	
SL:						
Smithdale-----------------	VIIe	---	---	---	---	
Lucy----------------------	VIs	---	---	---	---	

See footnote at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Bahiagrass	Improved bermudagrass	Tall fe
		Bu	Bu	AUM*	AUM*	AUM
SS:						
Smithdale	VIIe	---	---	---	---	-
Saffell	VIIe	---	---	---	---	-
Lucy	VIs	---	---	---	---	-
StA Stough	IIw	80	25	8.0	8.0	8

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one hor one mule, five sheep, or five goats) for 30 days.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	10,771	---	---	---	---
II	75,813	33,327	25,220	17,266	---
III	71,566	71,566	---	---	---
IV	28,569	11,043	17,526	---	---
V	40,682	---	40,682	---	---
VI	35,627	20,677	---	14,950	---
VII	77,624	73,931	3,693	---	---
VIII	---	---	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
BaA-----Bassfield	2o7	Slight	Slight	Slight	Slight	Cherrybark oak------	90	Cherrybark oak, loblolly pine, sweetgum, slash pine.
						Loblolly pine-------	90	
						Shortleaf pine------	80	
						Sweetgum------------	90	
						Slash pine----------	---	
Bb-----Bibb	2w9	Slight	Severe	Severe	Severe	Loblolly pine-------	90	Eastern cottonwood, loblolly pine*, sweetgum*, yellow-poplar, slash pine*.
						Sweetgum------------	90	
						Water oak-----------	90	
						Blackgum------------	---	
CaA-----Cahaba	2o7	Slight	Slight	Slight	Moderate	Loblolly pine-------	87	Loblolly pine, slash pine, yellow-poplar, sweetgum.
						Slash pine----------	91	
						Yellow-poplar-------	---	
						Sweetgum------------	90	
Cb-----Cascilla	1w7	Slight	Moderate	Moderate	Moderate	Cherrybark oak------	112	Cherrybark oak, eastern cottonwood, loblolly pine, sweetgum, American sycamore, yellow-poplar.
						Eastern cottonwood--	110	
						Loblolly pine-------	93	
						Nuttall oak---------	114	
						Water oak-----------	104	
						Sweetgum------------	102	
						Yellow-poplar-------	115	
CC:								
Cascilla----------	1w7	Slight	Moderate	Moderate	Moderate	Cherrybark oak------	112	Cherrybark oak, eastern cottonwood, loblolly pine, sweetgum, American sycamore, yellow-poplar.
						Eastern cottonwood--	110	
						Loblolly pine-------	93	
						Nuttall oak---------	114	
						Water oak-----------	104	
						Sweetgum------------	102	
						Yellow-poplar-------	115	
Chenneby----------	1w8	Slight	Moderate	Moderate	Severe	Loblolly pine-------	100	Loblolly pine, yellow-poplar, sweetgum, water oak, American sycamore.
						Sweetgum------------	100	
						Water oak-----------	100	
						Yellow-poplar-------	110	
						American sycamore---	110	
DC:								
Dorovan-----------	4w9	Slight	Severe	Severe	---------	Blackgum------------	70	Baldcypress.
						Sweetbay------------	---	
Croatan-----------	4w9	Slight	Severe	Severe	---------	Water tupelo--------	60	Loblolly pine*, slash pine*.
						Baldcypress---------	---	
						Loblolly pine-------	70	
						Sweetgum------------	---	
FaB, FaC-----------Falkner	2w8	Slight	Moderate	Slight	Moderate	Loblolly pine-------	85	Cherrybark oak, loblolly pine, shortleaf pine, sweetgum.
						Shortleaf pine------	75	
						Sweetgum------------	90	
FB:								
Falkner-----------	2w8	Slight	Moderate	Slight	Moderate	Loblolly pine-------	85	Cherrybark oak, loblolly pine, shortleaf pine, sweetgum.
						Shortleaf pine------	75	
						Sweetgum------------	90	
Benndale----------	2o1	Slight	Slight	Slight	Moderate	Loblolly pine-------	94	Loblolly pine, slash pine.
						Longleaf pine-------	79	
						Slash pine----------	94	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordi-nation symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Plant competi-tion	Common trees	Site index	
Gu----------------- Guyton	2w9	Slight	Severe	Moderate	---------	Loblolly pine------- Slash pine---------- Sweetgum------------ Green ash----------- Southern red oak---- Water oak-----------	90 90 --- --- --- ---	Loblolly pine, sweetgum.
Je----------------- Jena	1w7	Slight	Moderate	Moderate	---------	Loblolly pine------- Sweetgum------------ Water oak----------- Southern red oak---- White oak----------- Slash pine----------	100 90 80 --- --- ---	Loblolly pine, slash pine, American sycamore, eastern cottonwood.
Jg: Jena---------------	1w7	Slight	Moderate	Moderate	---------	Loblolly pine------- Sweetgum------------ Water oak----------- Southern red oak---- White oak----------- Slash pine----------	100 90 80 --- --- ---	Loblolly pine, slash pine, American sycamore, eastern cottonwood.
Bigbee-------------	2s5	Slight	Moderate	Moderate	Slight	Loblolly pine-------	88	Loblolly pine.
JN: Jena---------------	1w7	Slight	Moderate	Moderate	---------	Loblolly pine------- Sweetgum------------ Water oak----------- Southern red oak---- White oak----------- Slash pine----------	100 90 80 --- --- ---	Loblolly pine, slash pine, American sycamore, eastern cottonwood.
Nugent-------------	2s5	Slight	Moderate	Moderate	Slight	Loblolly pine------- Slash pine---------- Sweetgum------------ Water oak----------- Willow oak----------	90 90 95 85 85	Loblolly pine, slash pine, sweetgum, water oak, yellow-poplar.
Jt: Johnston-----------	1w9	Slight	Severe	Severe	---------	Water tupelo-------- Swamp tupelo-------- Water oak----------- Baldcypress--------- Loblolly pine------- Sweetgum------------	--- --- 103 --- 97 111	Loblolly pine*, slash pine*, baldcypress, American sycamore*, sweetgum*, green ash*.
Croatan------------	4w9	Slight	Severe	Severe	---------	Water tupelo-------- Baldcypress--------- Sweetgum------------	60 --- ---	Loblolly pine*, slash pine*.
LaA---------------- Latonia	2o1	Slight	Slight	Slight	Slight	Loblolly pine------- Longleaf pine------- Slash pine----------	90 70 90	Loblolly pine, slash pine.
LuA---------------- Lucedale	2o1	Slight	Slight	Slight	Slight	Loblolly pine------- Longleaf pine------- Slash pine----------	90 75 90	Loblolly pine, slash pine.
MnB, MnC----------- McLaurin	2o1	Slight	Slight	Slight	Slight	Loblolly pine------- Longleaf pine------- Slash pine----------	90 72 90	Loblolly pine, slash pine.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
Ng----------------- Nugent	2s5	Slight	Moderate	Moderate	Slight	Loblolly pine------- Slash pine---------- Sweetgum------------ Water oak----------- Willow oak----------	90 90 95 85 85	Loblolly pine, slash pine, sweetgum, water oak, yellow-poplar.
PS: Petal--------------	2o7	Slight	Slight	Slight	Slight	Loblolly pine------- Longleaf pine------- Shortleaf pine------ Slash pine----------	90 75 80 85	Loblolly pine, longleaf pine, slash pine, cherrybark oak.
Susquehanna--------	3c2	Slight	Moderate	Slight	Moderate	Loblolly pine------- Shortleaf pine------ Slash pine----------	78 68 ---	Loblolly pine, shortleaf pine.
PxA----------------- Prentiss	2o7	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Sweetgum------------ Cherrybark oak------ White oak-----------	88 79 90 90 80	Loblolly pine, slash pine.
RuB, RuC------------ Ruston	2o1	Slight	Slight	Slight	--------	Loblolly pine------- Slash pine---------- Longleaf pine-------	91 91 76	Loblolly pine, slash pine, longleaf pine.
SaF----------------- Saffell	4f2	Moderate	Moderate	Moderate	--------	Loblolly pine------- Shortleaf pine------ White oak----------- Chestnut oak--------	75 65 --- ---	Loblolly pine, shortleaf pine.
ShA, ShB, ShC------ Savannah	2o7	Slight	Slight	Slight	Moderate	Loblolly pine------- Longleaf pine------- Slash pine---------- Sweetgum------------	88 78 88 85	Loblolly pine, slash pine, sweetgum, American sycamore, yellow-poplar.
SkE----------------- Smithdale	2o1	Slight	Slight	Slight	Slight	Shortleaf pine------ Loblolly pine------- Longleaf pine------- Slash pine----------	69 86 69 85	Loblolly pine.
SkF----------------- Smithdale	2o1	Slight	Moderate	Slight	Slight	Shortleaf pine------ Loblolly pine------- Longleaf pine------- Slash pine----------	69 86 69 85	Loblolly pine.
SL: Smithdale----------	2o1	Slight	Moderate	Slight	Slight	Shortleaf pine------ Loblolly pine------- Longleaf pine------- Slash pine----------	69 86 69 85	Loblolly pine.
Lucy---------------	3s2	Moderate	Moderate	Severe	Moderate	Longleaf pine------- Loblolly pine------- Shortleaf pine------	71 84 ---	Longleaf pine, loblolly pine.
SS: Smithdale----------	2o1	Slight	Slight	Slight	Moderate	Shortleaf pine------ Loblolly pine------- Longleaf pine------- Slash pine----------	69 86 69 85	Loblolly pine.
Saffell------------	4f2	Moderate	Moderate	Moderate	--------	Loblolly pine------- Shortleaf pine------ White oak----------- Chestnut oak--------	75 65 --- ---	Loblolly pine, shortleaf pine.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordi-nation symbol	Management concerns: Erosion hazard	Management concerns: Equip-ment limita-tion	Management concerns: Seedling mortal-ity	Management concerns: Plant competi-tion	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
SS:								
Lucy	3s2	Moderate	Moderate	Severe	Moderate	Longleaf pine Loblolly pine Shortleaf pine	71 84 ---	Longleaf pine, loblolly pine.
StA Stough	2w8	Slight	Moderate	Slight	Moderate	Cherrybark oak Loblolly pine Slash pine Sweetgum Water oak	85 90 86 85 80	Loblolly pine, slash pine, sweetgum.

* Adequate surface drainage must be provided before planting.

TABLE 8.--WOODLAND UNDERSTORY VEGETATION

[Only the soils suitable for production of commercial trees are listed]

Map symbol and soil name	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
BaA------------------ Bassfield	Favorable	---	Slender bluestem---------------------------	4
	Normal	1,000	Beaked panicum-----------------------------	12
	Unfavorable	---	Pinehill bluestem--------------------------	23
			Longleaf uniola----------------------------	23
Bb------------------- Bibb	Favorable	---	Pinehill bluestem--------------------------	25
	Normal	1,200	Cutover muhly------------------------------	17
	Unfavorable	---	Longleaf uniola----------------------------	17
			Grassleaf goldaster------------------------	13
			Beaked panicum-----------------------------	7
CaA------------------ Cahaba	Favorable	---	Pinehill bluestem--------------------------	23
	Normal	1,000	Longleaf uniola----------------------------	23
	Unfavorable	---	Beaked panicum-----------------------------	12
			Slender bluestem---------------------------	4
Cb------------------- Cascilla	Favorable	---	Beaked panicum-----------------------------	31
	Normal	1,600	Pinehill bluestem--------------------------	25
	Unfavorable	---	Longleaf uniola----------------------------	19
CC: Cascilla-----------	Favorable	---	Beaked panicum-----------------------------	31
	Normal	1,600	Pinehill bluestem--------------------------	25
	Unfavorable	---	Longleaf uniola----------------------------	19
Chenneby-----------	Favorable	---	Pinehill bluestem--------------------------	33
	Normal	1,500	Switch cane--------------------------------	27
	Unfavorable	---	Longleaf uniola----------------------------	20
FaB, FaC------------ Falkner	Favorable	---	Pinehill bluestem--------------------------	33
	Normal	1,500	Switchcane---------------------------------	27
	Unfavorable	---	Longleaf uniola----------------------------	20
FB: Falkner------------	Favorable	---	Pinehill bluestem--------------------------	33
	Normal	1,500	Switchcane---------------------------------	27
	Unfavorable	---	Longleaf uniola----------------------------	20
Benndale-----------	Favorable	---	Pinehill bluestem--------------------------	46
	Normal	1,300	Slender bluestem---------------------------	15
	Unfavorable	---	Beaked panicum-----------------------------	15
Gu------------------- Guyton	Favorable	---	Pinehill bluestem--------------------------	25
	Normal	1,200	Cutover muhly------------------------------	17
	Unfavorable	---	Longleaf uniola----------------------------	17
Je------------------- Jena	Favorable	---	Pinehill bluestem--------------------------	46
	Normal	1,300	Beaked panicum-----------------------------	11
	Unfavorable	---	Longleaf uniola----------------------------	23
Jg: Jena---------------	Favorable	---	Pinehill bluestem--------------------------	24
	Normal	1,250	Beaked panicum-----------------------------	8
	Unfavorable	---	Longleaf uniola----------------------------	16
			Cutover muhly------------------------------	16
Bigbee-------------	Favorable	---	Pinehill bluestem--------------------------	38
	Normal	800	Panicum------------------------------------	13
	Unfavorable	---	Threeawn-----------------------------------	13
			Grassleaf goldaster------------------------	12
			Pineywoods dropseed------------------------	12

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Map symbol and soil name	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
JN:				
Jena	Favorable	---	Pinehill bluestem	24
	Normal	1,250	Cutover muhly	16
	Unfavorable	---	Longleaf uniola	16
			Beaked panicum	8
Nugent	Favorable	---	Pinehill bluestem	30
	Normal	1,000	Longleaf uniola	30
	Unfavorable	---	Beaked panicum	15
			Panicum	10
			Slender bluestem	5
			Grassleaf goldaster	5
Jt:				
Johnston	Favorable	---	Pinehill bluestem	25
	Normal	1,200	Cutover muhly	16
	Unfavorable	---	Longleaf uniola	16
			Beaked panicum	8
Croatan.				
LaA Latonia	Favorable	---	Pinehill bluestem	46
	Normal	1,300	Beaked panicum	15
	Unfavorable	---	Slender bluestem	15
LuA Lucedale	Favorable	---	Pinehill bluestem	46
	Normal	1,300	Beaked panicum	15
	Unfavorable	---	Slender bluestem	15
MnB, MnC McLaurin	Favorable	---	Slender bluestem	15
	Normal	1,300	Beaked panicum	15
	Unfavorable	---	Pinehill bluestem	46
Ng Nugent	Favorable	---	Pinehill bluestem	30
	Normal	1,000	Longleaf uniola	30
	Unfavorable	---	Beaked panicum	15
			Panicum	10
			Slender bluestem	5
			Grassleaf goldaster	5
PS:				
Petal	Favorable	---	Pinehill bluestem	23
	Normal	1,000	Longleaf uniola	23
	Unfavorable	---	Beaked panicum	12
Susquehanna	Favorable	---	Pinehill bluestem	30
	Normal	1,000	Beaked panicum	15
	Unfavorable	---	Panicum	10
PxA Prentiss	Favorable	1,000	Pinehill bluestem	23
	Normal	---	Longleaf uniola	23
	Unfavorable	---	Beaked panicum	12
RuB, RuC Ruston	Favorable	---	Slender bluestem	50
	Normal	1,300	Pinehill bluestem	15
	Unfavorable	---	Beaked panicum	10
			Panicum	10
SaF Saffell	Favorable	---	Pinehill bluestem	57
	Normal	700	Panicum	14
	Unfavorable	---	Threeawn	14
			Pineywoods dropseed	14

TABLE 8.--WOODLAND UNDERSTORY VEGETATION--Continued

Map symbol and soil name	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
		Lb/acre		Pct
ShA, ShB, ShC: Savannah	Favorable	---	Longleaf uniola	23
	Normal	1,000	Pinehill bluestem	23
	Unfavorable	---	Beaked panicum	12
			Panicum	8
SkE, SkF: Smithdale	Favorable	---	Slender bluestem	15
	Normal	1,300	Pinehill bluestem	46
	Unfavorable	---	Beaked panicum	15
			Panicum	12
SL:				
Smithdale	Favorable	---	Slender bluestem	15
	Normal	1,300	Pinehill bluestem	46
	Unfavorable	---	Beaked panicum	15
			Panicum	12
Lucy	Favorable	---	Pinehill bluestem	57
	Normal	700	Pineywoods dropseed	14
	Unfavorable	---	Panicum	14
			Pineland threeawn	14
SS:				
Smithdale	Favorable	---	Slender bluestem	15
	Normal	1,300	Pinehill bluestem	46
	Unfavorable	---	Beaked panicum	15
			Panicum	12
Saffell	Favorable	---	Pinehill bluestem	57
	Normal	700	Panicum	14
	Unfavorable	---	Threeawn	14
			Pineywoods dropseed	14
Lucy	Favorable	---	Pinehill bluestem	57
	Normal	700	Pineywoods dropseed	14
	Unfavorable	---	Panicum	14
			Pineland threeawn	14
StA: Stough	Favorable	---	Pinehill bluestem	25
	Normal	1,200	Longleaf uniola	17
	Unfavorable	---	Cutover muhly	17
			Beaked panicum	8

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BaA: Bassfield	Slight	Slight	Moderate: small stones.	Slight	Slight.
Bb: Bibb	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
CaA: Cahaba	Slight	Slight	Slight	Slight	Slight.
Cb: Cascilla	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
CC:					
Cascilla	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Chenneby	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Severe: erodes easily.	Severe: flooding.
DC:					
Dorovan	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
Croatan	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus, too acid.	Severe: excess humus, wetness, flooding.	Severe: wetness, excess humus.	Severe: too acid, wetness, flooding.
FaB: Falkner	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
FaC: Falkner	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness.
FB:					
Falkner	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
Benndale	Slight	Slight	Moderate: slope.	Slight	Slight.
Gu: Guyton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness, erodes easily.	Severe: wetness, flooding.
Je: Jena	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Jg:					
Jena	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Jg:					
Bigbee	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
JN:					
Jena	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Nugent	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy, flooding.	Severe: too sandy.	Severe: flooding.
Jt:					
Johnston	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding.
Croatan	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus, too acid.	Severe: excess humus, wetness, flooding.	Severe: wetness, excess humus.	Severe: too acid, wetness, flooding.
LaA: Latonia	Slight	Slight	Moderate: small stones.	Slight	Moderate: droughty.
LuA: Lucedale	Slight	Slight	Slight	Slight	Slight.
MnB: McLaurin	Slight	Slight	Moderate: slope.	Slight	Slight.
MnC: McLaurin	Slight	Slight	Severe: slope.	Slight	Slight.
Ng: Nugent	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy, flooding.	Severe: too sandy.	Severe: flooding.
PS:					
Petal	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
Susquehanna	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight	Slight.
Pt:					
Pits.					
Udorthents.					
PxA: Prentiss	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Moderate: droughty.
RuB: Ruston	Slight	Slight	Moderate: slope.	Slight	Slight.
RuC: Ruston	Slight	Slight	Severe: slope.	Slight	Slight.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
SaF------------------- Saffell	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
ShA------------------- Savannah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness, droughty.
ShB------------------- Savannah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness, droughty.
ShC------------------- Savannah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Moderate: wetness.	Moderate: wetness, droughty.
SkE------------------- Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
SkF------------------- Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SL:					
Smithdale------------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Lucy-----------------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
SS:					
Smithdale------------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Saffell--------------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Lucy-----------------	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
StA------------------- Stough	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.

TABLE 10.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
BaA Bassfield	Good	Good	Good	Good	Poor	---	Very poor.	Very poor.	Good	Good	Very poor.
Bb Bibb	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good
CaA Cahaba	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Cb Cascilla	Poor	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
CC:											
Cascilla	Poor	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Chenneby	Poor	Fair	Fair	Good	Good	---	Fair	Fair	Fair	Good	Fair
DC:											
Dorovan	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Good	Good	Very poor.	Very poor.	Good
Croatan	Very poor.	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good
FaB, FaC Falkner	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FB:											
Falkner	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Benndale	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
Gu Guyton	Poor	Fair	Fair	Fair	---	---	Good	Good	Poor	Fair	Good
Je Jena	Poor	Fair	Fair	Good	Good	---	Poor	Poor	Fair	Good	Poor
Jg:											
Jena	Poor	Fair	Fair	Good	Good	---	Poor	Poor	Fair	Good	Poor
Bigbee	Poor	Fair	Fair	Poor	Fair	---	Very poor.	Very poor.	Fair	Poor	Very poor.
JN:											
Jena	Poor	Fair	Fair	Good	Good	---	Poor	Poor	Fair	Good	Poor
Nugent	Poor	Poor	Fair	Poor	Poor	---	Very poor.	Very poor.	Poor	Poor	Very poor.
Jt:											
Johnston	Very poor.	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good
Croatan	Very poor.	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good
LaA Latonia	Good	Good	Good	Good	Poor	---	Very poor.	Very poor.	Good	Good	Very poor.

TABLE 10.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
LuA: Lucedale	Good	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
MnB: McLaurin	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
MnC: McLaurin	Fair	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
Ng: Nugent	Poor	Poor	Fair	Poor	Poor	---	Very poor.	Very poor.	Poor	Poor	Very poor.
PS:											
Petal	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
Susquehanna	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
Pt:											
Pits.											
Udorthents.											
PxA: Prentiss	Fair	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
RuB: Ruston	Good	Good	Good	---	Good	---	Poor	Very poor.	Good	Good	Very poor.
RuC: Ruston	Fair	Good	Good	---	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
SaF: Saffell	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.
ShA, ShB: Savannah	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
ShC: Savannah	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
SkE: Smithdale	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
SkF: Smithdale	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
SL:											
Smithdale	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
Lucy	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
SS:											
Smithdale	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
Saffell	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.
Lucy	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
StA: Stough	Fair	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BaA---------------- Bassfield	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
Bb----------------- Bibb	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
CaA---------------- Cahaba	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
Cb----------------- Cascilla	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
CC:						
Cascilla----------	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
Chenneby----------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding.	Severe: flooding.
DC:						
Dorovan-----------	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: ponding, flooding, excess humus.
Croatan-----------	Severe: excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness.	Severe: flooding, wetness, low strength.	Severe: wetness, flooding.	Severe: too acid, wetness, flooding.
FaB, FaC----------- Falkner	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness.
FB:						
Falkner-----------	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness.
Benndale----------	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
Gu----------------- Guyton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Je----------------- Jena	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Jg:						
Jena--------------	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Bigbee------------	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
JN:						
Jena--------------	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Nugent------------	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Jt:						
Johnston	Severe: cutbanks cave, excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: ponding, flooding.
Croatan	Severe: excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness.	Severe: flooding, wetness, low strength.	Severe: wetness, flooding.	Severe: too acid, wetness, flooding.
LaA Latonia	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
LuA Lucedale	Slight	Slight	Slight	Slight	Slight	Slight.
MnB McLaurin	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Slight.
MnC McLaurin	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Slight.
Ng Nugent	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
PS:						
Petal	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Severe: shrink-swell.	Severe: slope.	Moderate: slope, shrink-swell.	Moderate: slope.
Susquehanna	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
Pt:						
Pits.						
Udorthents.						
PxA Prentiss	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty.
RuB Ruston	Slight	Slight	Slight	Slight	Moderate: low strength.	Slight.
RuC Ruston	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
SaF Saffell	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ShA, ShB Savannah	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
ShC Savannah	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness.	Moderate: wetness, droughty.
SkE Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
SkF Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
SL:						
Smithdale--------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lucy-------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SS:						
Smithdale--------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Saffell----------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lucy-------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
StA--------------- Stough	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BaA: Bassfield	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer.
Bb: Bibb	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
CaA: Cahaba	Slight	Severe: seepage.	Severe: seepage.	Slight	Fair: thin layer.
Cb: Cascilla	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
CC:					
Cascilla	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
Chenneby	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.
DC:					
Dorovan	Severe: flooding, ponding, poor filter.	Severe: flooding, excess humus, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding, excess humus.
Croatan	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, excess humus.	Severe: flooding, wetness, too acid.	Severe: flooding, seepage, wetness.	Poor: wetness, thin layer.
FaB, FaC: Falkner	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
FB:					
Falkner	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
Benndale	Slight	Moderate: seepage, slope.	Severe: seepage.	Slight	Good.
Gu: Guyton	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Je: Jena	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Fair: too sandy.
Jg:					
Jena	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Fair: too sandy.

TABLE 12.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Jg:					
Bigbee	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage, too sandy.
JN:					
Jena	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Fair: too sandy.
Nugent	Severe: flooding, wetness.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage.
Jt:					
Johnston	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, ponding.
Croatan	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, excess humus.	Severe: flooding, wetness, too acid.	Severe: flooding, seepage, wetness.	Poor: wetness, thin layer.
LaA Latonia	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
LuA Lucedale	Slight	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
MnB, MnC McLaurin	Slight	Severe: seepage.	Slight	Severe: seepage.	Good.
Ng Nugent	Severe: flooding, wetness.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage.
PS:					
Petal	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
Susquehanna	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Pt:					
Pits.					
Udorthents.					
PxA Prentiss	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
RuB, RuC Ruston	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
SaF Saffell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.

TABLE 12.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ShA, ShB, ShC: Savannah	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
SkE: Smithdale	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.
SkF: Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
SL:					
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Lucy	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: slope.
SS:					
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Saffell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.
Lucy	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: slope.
StA: Stough	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
BaA: Bassfield	Good	Probable	Improbable: too sandy.	Fair: small stones.
Bb: Bibb	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
CaA: Cahaba	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Cb: Cascilla	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
CC:				
Cascilla	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Chenneby	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
DC:				
Dorovan	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
Croatan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness, too acid.
FaB, FaC: Falkner	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
FB:				
Falkner	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Benndale	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Gu: Guyton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Je: Jena	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Jg:				
Jena	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Bigbee	Good	Probable	Improbable: too sandy.	Fair: too sandy, small stones.
JN:				
Jena	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Nugent	Good	Probable	Improbable: too sandy.	Poor: too sandy.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Jt:				
Johnston	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Croatan	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness, too acid.
LaA Latonia	Good	Probable	Improbable: too sandy.	Fair: small stones, thin layer.
LuA Lucedale	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
MnB, MnC McLaurin	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Ng Nugent	Good	Probable	Improbable: too sandy.	Poor: too sandy.
PS:				
Petal	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, slope.
Susquehanna	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Pt:				
Pits.				
Udorthents.				
PxA Prentiss	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
RuB, RuC Ruston	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
SaF Saffell	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
ShA, ShB, ShC Savannah	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
SkE Smithdale	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
SkF Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
SL:				
Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Lucy	Fair: slope.	Improbable: excess fines, thin layer.	Improbable: excess fines.	Poor: slope.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
SS:				
Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Saffell	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Lucy	Fair: slope.	Improbable: excess fines, thin layer.	Improbable: excess fines.	Poor: slope.
StA: Stough	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
BaA: Bassfield	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable	Favorable.
Bb: Bibb	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding	Wetness	Wetness.
CaA: Cahaba	Severe: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Favorable	Favorable.
Cb: Cascilla	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
CC:						
Cascilla	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
Chenneby	Moderate: seepage.	Severe: piping, hard to pack, wetness.	Moderate: slow refill.	Flooding	Erodes easily, wetness.	Wetness, erodes easily.
DC:						
Dorovan	Moderate: seepage.	Severe: excess humus, ponding.	Severe: cutbanks cave.	Ponding, flooding, subsides.	Ponding	Wetness.
Croatan	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, flooding, subsides.	Wetness	Wetness, percs slowly.
FaB, FaC: Falkner	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
FB:						
Falkner	Slight	Severe: hard to pack.	Severe: no water.	Percs slowly	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
Benndale	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable	Favorable.
Gu: Guyton	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Percs slowly, flooding.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Je: Jena	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Favorable	Droughty.
Jg:						
Jena	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Favorable	Droughty.
Bigbee	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water, cutbanks cave.	Too sandy	Droughty.
JN:						
Jena	Severe: seepage.	Severe: piping, seepage.	Severe: no water.	Deep to water	Favorable	Droughty.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
JN:						
Nugent	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Too sandy	Droughty.
Jt:						
Johnston	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, cutbanks cave.	Ponding	Wetness.
Croatan	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, flooding, subsides.	Wetness	Wetness, percs slowly.
LaA: Latonia	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy	Droughty.
LuA: Lucedale	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable	Favorable.
MnB, MnC: McLaurin	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable	Favorable.
Ng: Nugent	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Too sandy	Droughty.
PS:						
Petal	Slight	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Slope, percs slowly.
Susquehanna	Slight	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly	Percs slowly.
Pt:						
Pits.						
Udorthents.						
PxA: Prentiss	Moderate: seepage.	Severe: piping.	Severe: no water.	Favorable	Wetness, rooting depth.	Droughty, rooting depth.
RuB, RuC: Ruston	Moderate: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Favorable	Favorable.
SaF: Saffell	Severe: slope, seepage.	Slight	Severe: no water.	Deep to water	Slope	Slope, droughty.
ShA: Savannah	Moderate: seepage.	Severe: piping.	Severe: no water.	Favorable	Wetness, rooting depth.	Rooting depth.
ShB, ShC: Savannah	Moderate: seepage.	Severe: piping.	Severe: no water.	Slope	Wetness, rooting depth.	Rooting depth.
SkE: Smithdale	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
SkF: Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
SL:						
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Terraces and diversions	Grassed waterways
SL:						
Lucy	Severe: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Too sandy, slope.	Slope, droughty.
SS:						
Smithdale	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope.
Saffell	Severe: slope, seepage.	Slight	Severe: no water.	Deep to water	Slope	Slope, droughty.
Lucy	Severe: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Too sandy, slope.	Slope, droughty.
StA: Stough	Slight	Moderate: piping, wetness.	Severe: no water.	Favorable	Erodes easily, wetness.	Wetness, erodes easily, droughty.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils may have Unified classifications and USDA textures in addition to those shown. In general, the dominant classifications and textures are shown]

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
BaA-------------- Bassfield	0-7	Sandy loam--------	SM, ML	A-2, A-4	0	90-100	85-100	55-96	25-58	<20	NP-3
	7-41	Sandy loam, loam	SM, SC, SM-SC	A-2, A-4	0	90-100	85-100	60-92	30-50	<20	NP-10
	41-75	Loamy sand, sand	SP-SM, SM	A-2, A-3	0	90-100	80-100	65-85	5-20	<20	NP-3
Bb--------------- Bibb	0-40	Silt loam--------	ML, CL-ML	A-4	0-5	95-100	90-100	80-90	50-80	<25	NP-7
	40-75	Sandy loam, loam, silt loam.	SM, SM-SC, ML, CL-ML	A-2, A-4	0-10	60-100	50-100	40-100	30-90	<30	NP-7
CaA-------------- Cahaba	0-8	Fine sandy loam	SM	A-4, A-2-4	0	95-100	95-100	65-90	30-45	---	NP
	8-38	Sandy clay loam, loam, clay loam.	SC, CL	A-4, A-6	0	90-100	80-100	75-90	40-75	22-35	8-15
	38-80	Sand, loamy sand, sandy loam.	SM, SP-SM	A-2-4	0	95-100	90-100	60-85	10-35	---	NP
Cb--------------- Cascilla	0-5	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	20-38	3-15
	5-48	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	95-100	75-100	20-39	5-15
	48-80	Fine sandy loam, loam, silt loam.	SM, ML, CL-ML, SM-SC	A-4	0	100	100	80-95	45-85	<30	NP-7
CC: Cascilla--------	0-5	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	20-38	3-15
	5-48	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	95-100	75-100	20-39	5-15
	48-80	Fine sandy loam, loam, silt loam.	SM, ML, CL-ML, SM-SC	A-4	0	100	100	80-95	45-85	<30	NP-7
Chenneby---------	0-10	Silt loam--------	CL, ML	A-4, A-6	0	100	95-100	90-100	60-90	20-35	3-15
	10-58	Loam, silt loam, silty clay loam.	CL, ML, MH, CH	A-4, A-6, A-7	0	100	95-100	90-100	75-95	30-55	8-20
	58-70	Stratified sandy loam to silty clay loam.	SM, ML, SC, CL	A-2-4, A-4	0	100	100	65-90	20-75	<30	NP-8
DC: Dorovan---------	0-58	Muck-------------	PT	---	0	---	---	---	---	---	---
	58-65	Sand, loamy sand, loam.	SP-SM, SM-SC, SM	A-1, A-3, A-4, A-2-4	0	100	100	5-70	5-49	<20	NP-7
Croatan---------	0-36	Sapric material	PT	---	---	---	---	---	---	---	---
	36-65	Sandy loam, fine sandy loam, mucky sandy loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	60-85	25-49	<30	NP-10
FaB, FaC--------- Falkner	0-9	Silt loam--------	CL-ML, CL	A-4	0	100	100	95-100	90-100	20-30	5-10
	9-18	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	85-95	30-45	15-30
	18-65	Silty clay, clay	CH	A-7	0	100	100	90-100	85-95	51-75	30-50
FB: Falkner---------	0-9	Silt loam--------	CL-ML, CL	A-4	0	100	100	95-100	90-100	20-30	5-10
	9-18	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	85-95	30-45	15-30
	18-65	Silty clay, clay	CH	A-7	0	100	100	90-100	85-95	51-75	30-50

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
FB:											
Benndale	0-8	Sandy loam	ML, SM, CL-ML, SM-SC	A-4, A-2-4	0	100	100	60-96	30-55	<25	NP-7
	8-34	Loam, sandy loam, fine sandy loam.	ML, SM, CL-ML, SM-SC	A-4	0	100	100	70-95	40-75	15-22	3-7
	34-60	Loam, sandy loam, sandy clay loam.	ML, SM, CL-ML, SM-SC	A-4, A-6	0	100	100	70-98	40-75	15-38	3-15
	60-70	Loam, sandy loam, loamy sand.	SM, ML, CL-ML, SM-SC	A-2, A-4	0	95-100	95-100	60-95	25-65	<25	NP-5
Gu: Guyton	0-17	Silt loam	ML, CL-ML	A-4	0	100	100	95-100	65-90	<27	NP-7
	17-36	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	0	100	100	94-100	75-95	22-40	6-18
	36-62	Silt loam, silty clay loam, sandy clay loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	50-95	<40	NP-18
Je: Jena	0-6	Fine sandy loam	ML, SM, CL-ML, SM-SC	A-4, A-2-4	0	100	100	60-85	25-55	<22	NP-5
	6-33	Silt loam, very fine sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4, A-2-4	0	100	100	55-90	25-70	<22	NP-5
	33-70	Fine sandy loam, sandy loam, loamy fine sand.	SM	A-2-4, A-4	0	100	100	50-80	20-50	---	NP
Jg:											
Jena	0-6	Fine sandy loam	ML, SM, CL-ML, SM-SC	A-4, A-2-4	0	100	100	60-85	25-55	<22	NP-5
	6-33	Silt loam, very fine sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4, A-2-4	0	100	100	55-90	25-70	<22	NP-5
	33-70	Fine sandy loam, sandy loam, loamy fine sand.	SM	A-2-4, A-4	0	100	100	50-80	20-50	---	NP
Bigbee	0-40	Loamy fine sand	SM, SP-SM	A-2-4, A-3	0	100	95-100	80-95	5-30	---	NP
	40-70	Sand, fine sand	SP-SM, SM	A-2-4, A-3	0	85-100	85-100	80-100	5-20	---	NP
JN:											
Jena	0-6	Fine sandy loam	ML, SM, CL-ML, SM-SC	A-4, A-2-4	0	100	100	60-85	25-55	<22	NP-5
	6-33	Silt loam, very fine sandy loam, loam.	SM, ML, CL-ML, SM-SC	A-4, A-2-4	0	100	100	55-90	25-70	<22	NP-5
	33-70	Fine sandy loam, sandy loam, loamy fine sand.	SM	A-2-4, A-4	0	100	100	50-80	20-50	---	NP
Nugent	0-10	Sand	SM, SP-SM	A-2	0	85-100	75-100	50-100	10-30	---	NP
	10-62	Stratified loamy sand to fine sandy loam.	SM, SP-SM	A-2	0	85-100	75-100	60-100	10-30	<25	NP-3

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Jt: Johnston	0-24	Mucky loam	OL, ML, CL-ML	A-8, A-4, A-5	0	100	100	90-100	51-75	20-45	2-14
	24-32	Stratified loamy sand to sand.	SM, SP-SM	A-2, A-3	0	100	100	50-100	5-30	---	NP
	32-70	Stratified fine sandy loam to sandy loam.	SM	A-2, A-4	0	100	100	50-100	25-49	<35	NP-10
Croatan	0-36	Sapric material	PT	---	---	---	---	---	---	---	---
	36-65	Sandy loam, fine sandy loam, mucky sandy loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	60-85	25-49	<30	NP-10
LaA: Latonia	0-8	Sandy loam	SM	A-2-4, A-4	0	90-100	85-100	60-75	30-50	---	NP
	8-37	Sandy loam, loam, fine sandy loam.	SM	A-2-4, A-4	0	90-100	85-100	60-85	30-50	---	NP
	37-80	Sand, loamy sand	SM, SP-SM	A-2-4	0	90-100	85-100	50-75	10-30	---	NP
LuA: Lucedale	0-6	Loam	SM, ML	A-2, A-4	0	100	95-100	80-95	25-65	<30	NP-3
	6-60	Sandy clay loam, clay loam, loam.	CL-ML, SC, CL, SM-SC	A-4, A-6, A-2	0	95-100	95-100	80-100	30-75	25-40	4-15
MnB, MnC: McLaurin	0-8	Fine sandy loam	SM	A-4	0	90-100	90-100	70-85	36-45	<30	NP-4
	8-32	Sandy loam, fine sandy loam.	SM, SC, SM-SC	A-4	0	90-100	90-100	85-95	36-45	<30	NP-10
	32-42	Loamy fine sand	SM	A-2	0	90-100	90-100	50-75	15-30	<20	NP-4
	42-62	Sandy loam, sandy clay loam, loam.	SC, ML, CL, SM	A-4, A-6	0	90-100	90-100	70-80	36-55	30-40	6-15
Ng: Nugent	0-10	Sand	SM, SP-SM	A-2	0	85-100	75-100	50-100	10-30	---	NP
	10-62	Stratified loamy sand to fine sandy loam.	SM, SP-SM	A-2	0	85-100	75-100	60-100	10-30	<25	NP-3
PS: Petal	0-10	Sandy loam	SM, CL, ML, CL-ML	A-4	0	100	95-100	60-90	40-70	<30	NP-8
	10-40	Loam, sandy clay loam, clay loam.	CL	A-4, A-6	0	100	95-100	80-95	55-75	25-40	7-20
	40-65	Clay loam, silty clay, clay.	CL, CH	A-6, A-7	0	100	95-100	90-100	80-95	38-55	20-30
Susquehanna	0-9	Fine sandy loam	ML, SM	A-4	0	100	100	65-90	40-55	---	NP
	9-62	Clay, silty clay loam, silty clay.	CH	A-7	0	100	100	88-100	80-98	50-90	28-56
Pt: Pits.											
Udorthents.											
PxA: Prentiss	0-25	Fine sandy loam	SC, SM-SC, SM	A-4	0	100	100	65-85	36-50	<30	NP-10
	25-65	Loam, sandy loam, fine sandy loam.	CL-ML, CL, SC, SM-SC	A-6, A-4	0	100	100	70-100	40-75	20-35	4-12
RuB, RuC: Ruston	0-6	Sandy loam	SM, ML	A-4, A-2-4	0	85-100	78-100	65-100	30-75	<20	NP-3
	6-29	Sandy clay loam, loam, clay loam.	SC, CL	A-6	0	85-100	78-100	70-100	36-75	30-40	11-20
	29-43	Fine sandy loam, sandy loam, loamy sand.	SM, ML, CL-ML, SM-SC	A-4, A-2-4	0	85-100	78-100	65-100	30-75	<27	NP-7
	43-62	Sandy clay loam, loam, clay loam.	SC, CL	A-6	0	85-100	78-100	70-100	36-75	30-42	11-20

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
SaF---------------Saffell	0-5	Gravelly sandy loam.	SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	5-11	Gravelly fine sandy loam, gravelly sandy clay loam, gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	11-48	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-65	20-55	15-35	20-40	4-18
	48-80	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
ShA, ShB, ShC----Savannah	0-10	Fine sandy loam	SM, ML	A-2-4, A-4	0	100	100	60-85	30-55	<25	NP-4
	10-26	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML	A-4, A-6	0	100	100	80-100	40-80	23-40	7-19
	26-70	Loam, clay loam, sandy clay loam.	CL, SC, CL-ML	A-4, A-6, A-7	0	100	100	80-100	40-80	23-43	7-19
SkE, SkF----------Smithdale	0-12	Sandy loam--------	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	12-36	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	36-84	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
SL:											
Smithdale--------	0-12	Sandy loam--------	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	12-36	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	36-84	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
Lucy-------------	0-21	Loamy sand--------	SM, SP-SM	A-2	0	98-100	95-100	50-87	10-30	---	NP
	21-32	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	97-100	95-100	55-95	15-50	10-30	NP-15
	32-62	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, SM	A-2, A-6, A-4	0	100	95-100	60-95	20-50	20-40	3-20
SS:											
Smithdale--------	0-12	Sandy loam--------	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	12-36	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	36-84	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
SS:											
Saffell----------	0-5	Gravelly sandy loam.	SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	5-11	Gravelly fine sandy loam, gravelly sandy clay loam, gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	11-48	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-65	20-55	15-35	20-40	4-18
	48-80	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
Lucy-------------	0-21	Loamy sand--------	SM, SP-SM	A-2	0	98-100	95-100	50-87	10-30	---	NP
	21-32	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	97-100	95-100	55-95	15-50	10-30	NP-15
	32-62	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, SM	A-2, A-6, A-4	0	100	95-100	60-95	20-50	20-40	3-20
StA--------------- Stough	0-24	Fine sandy loam	SM-SC, SM, ML, CL-ML	A-4	0	100	100	65-85	35-65	<25	NP-7
	24-34	Loam, fine sandy loam.	ML, CL, CL-ML	A-4	0	100	100	75-95	50-75	<25	NP-8
	34-62	Sandy loam, sandy clay loam, loam.	SC, CL	A-4, A-6	0	100	100	65-90	40-65	25-40	8-15

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
BaA---------------- Bassfield	0-7	4-10	1.40-1.50	2.0-6.0	0.10-0.15	4.5-5.5	Low-----------	0.20	4	1-3
	7-41	8-18	1.45-1.55	2.0-6.0	0.10-0.15	4.5-5.5	Low-----------	0.20		
	41-75	1-7	1.40-1.50	6.0-20	0.05-0.08	4.5-5.5	Very low------	0.17		
Bb----------------- Bibb	0-40	2-18	1.20-1.55	0.6-2.0	0.15-0.20	4.5-5.5	Low-----------	0.28	5	.5-2
	40-75	2-18	1.30-1.60	0.6-2.0	0.12-0.20	4.5-5.5	Low-----------	0.37		
CaA---------------- Cahaba	0-8	7-17	1.35-1.60	2.0-6.0	0.10-0.14	4.5-6.0	Low-----------	0.24	5	.5-2
	8-38	18-35	1.35-1.60	0.6-2.0	0.12-0.15	4.5-6.0	Low-----------	0.28		
	38-80	4-20	1.40-1.70	2.0-20	0.05-0.10	4.5-6.0	Low-----------	0.24		
Cb----------------- Cascilla	0-5	5-20	1.40-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low-----------	0.43	5	1-3
	5-48	18-30	1.45-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low-----------	0.43		
	48-80	5-25	1.40-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low-----------	0.43		
CC:										
Cascilla---------	0-5	5-20	1.40-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low-----------	0.43	5	1-3
	5-48	18-30	1.45-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low-----------	0.43		
	48-80	5-25	1.40-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low-----------	0.43		
Chenneby---------	0-10	12-27	1.30-1.60	0.6-2.0	0.14-0.20	4.5-6.0	Low-----------	0.37	5	.5-2
	10-58	12-35	1.30-1.50	0.6-2.0	0.15-0.20	4.5-6.0	Low-----------	0.32		
	58-70	8-30	1.30-1.50	2.0-6.0	0.05-0.10	4.5-6.0	Low-----------	0.24		
DC:										
Dorovan----------	0-58	---	0.35-0.55	0.6-2.0	0.25-0.50	3.6-4.4	--------------	----	---	---
	58-65	5-20	1.40-1.65	6.0-20	0.05-0.08	4.5-5.5	Low-----------	----		
Croatan----------	0-36	---	0.40-0.65	0.06-6.0	0.35-0.45	<4.5	Low-----------	----	---	25-60
	36-65	8-20	1.40-1.60	0.2-6.0	0.10-0.15	3.6-6.5	Low-----------	----		
FaB, FaC---------- Falkner	0-9	5-18	1.40-1.55	0.2-0.6	0.20-0.22	4.5-6.0	Low-----------	0.49	4	.5-3
	9-18	20-35	1.35-1.55	0.2-0.6	0.19-0.22	4.5-6.0	Moderate------	0.43		
	18-65	38-60	1.40-1.50	0.06-0.2	0.16-0.18	4.5-6.5	High----------	0.24		
FB:										
Falkner----------	0-9	5-18	1.40-1.55	0.2-0.6	0.20-0.22	4.5-6.0	Low-----------	0.49	4	.5-3
	9-18	20-35	1.35-1.55	0.2-0.6	0.19-0.22	4.5-6.0	Moderate------	0.43		
	18-65	38-60	1.40-1.50	0.06-0.2	0.16-0.18	4.5-6.5	High----------	0.24		
Benndale---------	0-8	6-14	1.45-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Low-----------	0.20	5	1-3
	8-34	10-18	1.55-1.65	0.6-2.0	0.12-0.18	4.5-5.5	Low-----------	0.28		
	34-60	14-28	1.55-1.65	0.6-2.0	0.12-0.18	4.5-5.5	Low-----------	0.32		
	60-70	6-2,	1.55-1.65	2.0-6.0	0.10-0.15	4.5-5.5	Low-----------	0.28		
Gu----------------- Guyton	0-17	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low-----------	0.43	5	<2
	17-36	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low-----------	0.37		
	36-62	20-35	1.35-1.70	0.06-2.0	0.15-0.22	3.6-8.4	Low-----------	0.37		
Je----------------- Jena	0-6	10-20	1.30-1.70	0.6-2.0	0.12-0.20	4.5-6.0	Low-----------	0.28	5	---
	6-33	10-18	1.40-1.80	0.6-2.0	0.10-0.20	4.5-5.5	Low-----------	0.28		
	33-70	5-20	1.35-1.65	2.0-6.0	0.08-0.14	4.5-5.5	Low-----------	0.24		
Jg:										
Jena-------------	0-6	10-20	1.30-1.70	0.6-2.0	0.12-0.20	4.5-6.0	Low-----------	0.28	5	---
	6-33	10-18	1.40-1.80	0.6-2.0	0.10-0.20	4.5-5.5	Low-----------	0.28		
	33-70	5-20	1.35-1.65	2.0-6.0	0.08-0.14	4.5-5.5	Low-----------	0.24		
Bigbee-----------	0-40	4-10	1.40-1.50	6.0-20	0.05-0.10	4.5-6.0	Low-----------	0.17	5	.5-2
	40-70	<5	1.40-1.50	6.0-20	0.05-0.08	4.5-6.0	Low-----------	0.17		

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
JN:										
Jena	0-6	10-20	1.30-1.70	0.6-2.0	0.12-0.20	4.5-6.0	Low	0.28	5	---
	6-33	10-18	1.40-1.80	0.6-2.0	0.10-0.20	4.5-5.5	Low	0.28		
	33-70	5-20	1.35-1.65	2.0-6.0	0.08-0.14	4.5-5.5	Low	0.24		
Nugent	0-10	2-8	1.20-1.40	6.0-20	0.05-0.10	4.5-6.5	Low	0.17	5	.5-2
	10-62	2-10	1.20-1.40	2.0-6.0	0.05-0.10	4.5-6.5	Low	0.17		
Jt:										
Johnston	0-24	7-18	1.25-1.45	2.0-6.0	0.20-0.26	4.5-5.5	Low	0.17	5	8-18
	24-32	2-12	1.55-1.65	6.0-20	0.02-0.07	4.5-5.5	Low	0.17		
	32-70	5-20	1.45-1.65	6.0-20	0.06-0.12	4.5-5.5	Low	0.17		
Croatan	0-36	---	0.40-0.65	0.06-6.0	0.35-0.45	<4.5	Low	----	---	25-60
	36-65	8-20	1.40-1.60	0.2-6.0	0.10-0.15	3.6-6.5	Low	----		
LaA: Latonia	0-8	10-20	1.40-1.50	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.20	4	---
	8-37	10-16	1.40-1.50	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.20		
	37-80	3-10	1.40-1.50	6.0-20	0.05-0.10	4.5-5.5	Very low	0.17		
LuA: Lucedale	0-6	1-10	1.40-1.55	0.6-2.0	0.15-0.20	5.1-6.5	Low	0.24	5	.5-2
	6-60	20-30	1.55-1.70	0.6-2.0	0.14-0.18	4.5-5.5	Low	0.24		
MnB, MnC: McLaurin	0-8	5-10	1.40-1.60	0.6-2.0	0.12-0.15	4.5-5.5	Low	0.20	5	---
	8-32	10-18	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.20		
	32-42	5-15	1.30-1.70	2.0-6.0	0.05-0.10	4.5-5.5	Very low	0.20		
	42-62	5-27	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.20		
Ng: Nugent	0-10	2-8	1.20-1.40	6.0-20	0.05-0.10	4.5-6.5	Low	0.17	5	.5-2
	10-62	2-10	1.20-1.40	2.0-6.0	0.05-0.10	4.5-6.5	Low	0.17		
PS:										
Petal	0-10	16-25	1.40-1.50	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.28	5	.5-2
	10-40	20-35	1.45-1.55	0.2-0.6	0.15-0.18	4.5-5.5	Moderate	0.32		
	40-65	30-50	1.40-1.55	0.06-0.2	0.15-0.18	4.5-5.5	High	0.32		
Susquehanna	0-9	2-12	1.50-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.28	5	.5-2
	9-62	35-60	1.25-1.50	<0.06	0.15-0.20	4.5-5.5	High	0.32		
Pt:										
Pits.										
Udorthents.										
PxA: Prentiss	0-25	5-18	1.50-1.60	0.6-2.0	0.12-0.16	4.5-5.5	Low	0.28	3	---
	25-65	10-20	1.65-1.75	0.2-0.6	0.06-0.09	4.5-5.5	Low	0.24		
RuB, RuC: Ruston	0-6	5-20	1.30-1.70	0.6-2.0	0.09-0.16	4.5-6.5	Low	0.28	5	.5-2
	6-29	18-35	1.40-1.80	0.6-2.0	0.12-0.17	4.5-6.0	Low	0.28		
	29-43	10-20	1.30-1.70	0.6-2.0	0.12-0.15	4.5-6.0	Low	0.32		
	43-62	15-38	1.40-1.70	0.6-2.0	0.12-0.17	4.5-6.0	Low	0.28		
SaF: Saffell	0-5	5-20	1.30-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low	0.20	4	1-2
	5-11	10-35	1.25-1.60	0.6-2.0	0.06-0.10	4.5-5.5	Low	0.28		
	11-48	12-35	1.25-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low	0.28		
	48-80	10-25	1.30-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low	0.17		
ShA, ShB, ShC: Savannah	0-10	3-16	1.45-1.65	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.24	3	.5-3
	10-26	18-32	1.55-1.75	0.6-2.0	0.13-0.20	4.5-5.5	Low	0.28		
	26-70	18-32	1.60-1.80	0.2-0.6	0.05-0.10	4.5-5.5	Low	0.24		
SkE, SkF: Smithdale	0-12	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low	0.28	5	.5-2
	12-36	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low	0.24		
	36-84	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low	0.28		

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
SL:										
Smithdale--------	0-12	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	.5-2
	12-36	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	36-84	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		
Lucy-------------	0-21	1-12	1.30-1.70	6.0-20	0.06-0.10	5.1-6.0	Low-----------	0.15	5	.5-1
	21-32	10-30	1.40-1.60	2.0-6.0	0.10-0.12	4.5-5.5	Low-----------	0.24		
	32-62	15-35	1.40-1.60	0.6-2.0	0.12-0.14	4.5-5.5	Low-----------	0.28		
SS:										
Smithdale--------	0-12	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	.5-2
	12-36	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
	36-84	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		
Saffell----------	0-5	5-20	1.30-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low-----------	0.20	4	1-2
	5-11	10-35	1.25-1.60	0.6-2.0	0.06-0.10	4.5-5.5	Low-----------	0.28		
	11-48	12-35	1.25-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low-----------	0.28		
	48-80	10-25	1.30-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low-----------	0.17		
Lucy-------------	0-21	1-12	1.30-1.70	6.0-20	0.06-0.10	5.1-6.0	Low-----------	0.15	5	.5-1
	21-32	10-30	1.40-1.60	2.0-6.0	0.10-0.12	4.5-5.5	Low-----------	0.24		
	32-62	15-35	1.40-1.60	0.6-2.0	0.12-0.14	4.5-5.5	Low-----------	0.28		
StA--------------- Stough	0-24	5-15	1.40-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Low-----------	0.37	3	---
	24-34	8-18	1.45-1.60	0.2-0.6	0.07-0.11	4.5-5.5	Low-----------	0.37		
	34-62	5-27	1.55-1.65	0.2-0.6	0.07-0.11	4.5-5.5	Low-----------	0.37		

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Bedrock depth	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft			In		
BaA----------- Bassfield	B	None--------	---	---	>6.0	---	---	>60	Low-------	Moderate.
Bb------------ Bibb	C	Frequent----	Brief----	Dec-May	0.5-1.5	Apparent	Dec-Apr	>60	High------	Moderate.
CaA----------- Cahaba	B	None--------	---	---	>6.0	---	---	>60	Moderate	Moderate.
Cb------------ Cascilla	B	Frequent----	Brief----	Jan-Apr	>6.0	---	---	>60	Low-------	Moderate.
CC:										
Cascilla-------	B	Frequent----	Brief to long.	Jan-Apr	>6.0	---	---	>60	Low-------	Moderate.
Chenneby-------	C	Frequent----	Brief to long.	Dec-Apr	1.0-2.5	Apparent	Jan-Mar	>60	High------	Moderate.
DC*:										
Dorovan--------	D	Frequent----	Very long	Jan-Dec	+1-0.5	Apparent	Jan-Dec	>60	High------	High.
Croatan--------	D	Frequent----	Very long	Jan-Dec	0-1.0	Apparent	Dec-May	>60	High------	High.
FaB, FaC-------- Falkner	C	None--------	---	---	1.5-2.5	Perched	Jan-Mar	>60	High------	Moderate.
FB:										
Falkner--------	C	None--------	---	---	1.5-2.5	Perched	Jan-Mar	>60	High------	Moderate.
Benndale-------	B	None--------	---	---	>6.0	---	---	>60	Low-------	Moderate.
Gu------------ Guyton	D	Frequent----	Brief----	Jan-Dec	0-1.5	Perched	Dec-May	>60	High------	Moderate.
Je------------ Jena	B	Frequent----	Brief----	Dec-Apr	>6.0	---	---	>60	Low-------	High.
Jg:										
Jena-----------	B	Frequent----	Long-----	Dec-Apr	>6.0	---	---	>60	Low-------	High.
Bigbee---------	A	Frequent----	Long-----	Jan-Mar	3.5-6.0	Apparent	Jan-Mar	>60	Low-------	Moderate.
JN:										
Jena-----------	B	Frequent----	Long-----	Dec-Apr	>6.0	---	---	>60	Low-------	High.
Nugent---------	A	Frequent----	Long-----	Dec-Apr	3.5-6.0	Apparent	Jan-Apr	>60	Low-------	Moderate.
Jt*:										
Johnston-------	D	Frequent----	Long-----	Nov-Jul	+1-1.5	Apparent	Nov-Jun	>60	High------	High.
Croatan--------	D	Frequent----	Very long	Jan-Dec	0-1.0	Apparent	Dec-May	>60	High------	High.
LaA----------- Latonia	B	None--------	---	---	>6.0	---	---	>60	Low-------	Moderate.
LuA----------- Lucedale	B	None--------	---	---	>6.0	---	---	>60	Moderate	Moderate.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Bedrock	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	depth	Uncoated steel	Concrete
					Ft			In		
MnB, MnC-------- McLaurin	B	None--------	---	---	>6.0	---	---	>60	Low--------	Moderate.
Ng-------------- Nugent	A	Frequent----	Long-----	Dec-Apr	3.5-6.0	Apparent	Jan-Apr	>60	Low--------	Moderate.
PS:										
Petal----------	C	None--------	---	---	2.5-3.5	Perched	Jan-Apr	>60	High-------	High.
Susquehanna----	D	None--------	---	---	>6.0	---	---	>60	High-------	High.
Pt:										
Pits.										
Udorthents.										
PxA------------- Prentiss	C	None--------	---	---	2.0-2.5	Perched	Jan-Mar	>60	Moderate	High.
RuB, RuC-------- Ruston	B	None--------	---	---	>6.0	---	---	>60	Moderate	Moderate.
SaF------------- Saffell	B	None--------	---	---	>6.0	---	---	>60	Low--------	Moderate.
ShA, ShB, ShC--- Savannah	C	None--------	---	---	1.5-3.0	Perched	Jan-Mar	>60	Moderate	High.
SkE, SkF-------- Smithdale	B	None--------	---	---	>6.0	---	---	>60	Low--------	Moderate.
SL:										
Smithdale------	B	None--------	---	---	>6.0	---	---	>60	Low--------	Moderate.
Lucy-----------	A	None--------	---	---	>6.0	---	---	>60	Low--------	High.
SS:										
Smithdale------	B	None--------	---	---	>6.0	---	---	>60	Low--------	Moderate.
Saffell--------	B	None--------	---	---	>6.0	---	---	>60	Low--------	Moderate.
Lucy-----------	A	None--------	---	---	>6.0	---	---	>60	Low--------	High.
StA------------- Stough	C	None--------	---	---	1.0-1.5	Perched	Jan-Apr	>60	Moderate	High.

*In the "High water table--Depth" column, a plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

TABLE 18.--PHYSICAL ANALYSES OF SELECTED SOILS

[All of the pedons in this table are typical of the series. Their description and location are in the section "Soil Series and Their Morphology." The soils were analyzed by the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural and Forestry Experiment Station]

Soil series and sample numbers	Horizon	Depth	Particle-size distribution			Organic Matter
			Sand (2.0-0.05 mm)	Silt (0.05-0.002mm)	Clay (<0.002 mm)	
		In	Pct	Pct	Pct	Pct
Bassfield: S81MS-091-2	Ap	0-6	66.5	29.7	3.8	1.5
	A	6-10	60.7	33.1	6.2	0.6
	Bt1	10-14	50.3	33.2	16.5	0.4
	Bt2	14-32	49.8	34.9	15.3	0.2
	Bt3	32-41	57.2	30.1	12.7	0.1
	C1	41-62	69.6	25.3	5.1	0.1
	C2	62-75	76.0	22.8	1.2	0.1
Falkner*: S81MS-091-3	Ap	0-5	35.3	59.5	5.2	7.5
	E	5-9	27.7	66.0	6.3	0.8
	Bt	9-18	20.0	56.6	23.4	0.3
	2Bt1	18-32	19.0	43.5	37.5	0.2
	2Bt2	32-56	14.3	42.2	43.5	0.2
	2Bt3	56-65	10.3	46.4	43.3	0.2
Guyton: S82MS-091-1	Ap	0-5	23.3	69.0	7.7	2.2
	Eg1	5-9	20.7	67.2	12.1	0.4
	Eg2	9-17	16.5	61.7	21.8	0.2
	B/E	17-24	16.7	62.3	21.0	0.1
	Btg1	24-36	11.0	62.9	26.1	0.1
	Btg2	36-50	13.3	53.1	33.6	---
	Btg3	50-62	14.1	58.7	27.2	---
Petal: S81MS-091-1	A	0-4	60.3	37.2	2.5	1.6
	E	4-10	54.3	41.9	3.8	0.5
	Bt1	10-16	34.4	30.6	35.0	0.5
	Bt2	16-25	34.6	33.9	31.5	0.3
	Bt3	25-34	30.5	40.0	29.5	0.2
	Bt4	34-40	26.8	42.5	30.7	0.1
	Bt5	40-54	22.5	48.2	29.3	0.1
	Btg	54-65	6.2	61.4	32.4	0.1

*The unusually high amount of organic matter is assumed to be due to the inclusion of some livestock excreta in the sample.

TABLE 19.--CHEMICAL ANALYSES OF SELECTED SOILS

[All of the pedons in this table are typical of the series. Their description and location are in the section "Soil Series and Their Morphology." The soils were analyzed by the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural and Forestry Experiment Station]

Soil series and sample numbers	Horizon	Depth	Reaction 1:1 (Soil: Water)	Extractable bases Ca	Extractable bases Mg	Extractable bases K	Extractable bases Na	Extractable acidity	Sum of cations	Base saturation
		In	pH	Meq/100g						Pct
Bassfield: S81MS-091-2	Ap	0-6	5.6	1.26	0.17	0.09	0.02	4.61	6.15	25
	A	6-10	5.2	1.16	0.19	0.09	0.04	3.77	5.25	28
	Bt1	10-14	4.5	1.42	0.49	0.17	0.02	6.48	8.58	24
	Bt2	14-32	4.9	0.89	0.54	0.08	0.03	10.34	11.88	13
	Bt3	32-41	4.8	0.11	0.44	0.06	0.07	7.33	8.01	8
	C1	41-62	4.7	0.02	0.30	0.03	0.06	4.76	5.17	8
	C2	62-75	4.7	0.01	0.35	0.04	0.01	5.04	5.45	7
Falkner*: S81MS-091-3	Ap	0-5	5.6	50.00	20.98	0.40	0.12	10.83	82.33	87
	E	5-9	5.6	1.46	0.93	0.09	0.07	3.78	6.33	40
	Bt	9-18	5.0	1.74	1.51	0.14	0.07	9.38	12.84	27
	2Bt1	18-32	4.8	1.50	2.66	0.19	0.20	14.26	18.81	24
	2Bt2	32-56	4.7	2.93	5.02	0.28	0.44	18.91	27.58	31
	2Bt3	56-65	5.2	47.11	7.16	0.33	0.53	18.76	73.89	75
Guyton: S82MS-091-1	Ap	0-5	4.3	0.62	0.42	0.08	0.10	7.46	8.68	14
	Eg1	5-9	4.4	0.16	0.30	0.04	0.08	6.14	6.72	9
	Eg2	9-17	4.3	0.04	0.59	0.06	0.24	12.46	13.39	7
	B/E	17-24	4.5	0.21	0.86	0.07	0.51	11.72	13.37	12
	Btg1	24-36	4.5	1.68	2.29	0.12	1.35	18.37	23.81	23
	Btg2	36-50	4.5	2.26	2.38	0.11	1.72	14.69	21.16	30
	Btg3	50-62	4.5	3.13	2.84	0.16	1.82	12.18	20.13	39
Petal: S81MS-091-1	A	0-4	4.7	0.48	0.14	0.06	0.02	4.05	4.75	15
	E	4-10	4.9	0.33	0.11	0.04	0.01	2.44	2.93	17
	Bt1	10-16	4.9	2.63	2.44	0.16	0.04	11.39	16.66	32
	Bt2	16-25	5.1	2.12	2.41	0.12	0.04	11.13	15.82	30
	Bt3	25-34	5.2	2.11	2.72	0.16	0.06	11.44	16.49	31
	Bt4	34-40	5.2	2.73	3.86	0.17	0.08	13.73	20.67	33
	Bt5	40-54	5.0	3.36	4.56	0.15	0.08	11.71	19.86	41
	Btg	54-65	5.0	5.70	7.63	0.17	0.12	12.78	26.40	51

*The unusually high amount of extractable bases, extractable acidity, sum of cations, and base saturation is assumed to be due to the inclusion of some livestock excreta in the sample.

TABLE 20.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Bassfield	Coarse-loamy, siliceous, thermic Typic Hapludults
Benndale	Coarse-loamy, siliceous, thermic Typic Paleudults
Bibb	Coarse-loamy, siliceous, acid, thermic Typic Fluvaquents
Bigbee	Thermic, coated Typic Quartzipsamments
Cahaba	Fine-loamy, siliceous, thermic Typic Hapludults
Cascilla	Fine-silty, mixed, thermic Fluventic Dystrochrepts
Chenneby	Fine-silty, mixed, thermic Fluvaquentic Dystrochrepts
Croatan	Loamy, siliceous, dysic, thermic Terric Medisaprists
Dorovan	Dysic, thermic Typic Medisaprists
Falkner	Fine-silty, siliceous, thermic Aquic Paleudalfs
Guyton	Fine-silty, siliceous, thermic Typic Glossaqualfs
Jena	Coarse-loamy, siliceous, thermic Fluventic Dystrochrepts
Johnston	Coarse-loamy, siliceous, acid, thermic Cumulic Humaquepts
Latonia	Coarse-loamy, siliceous, thermic Typic Hapludults
Lucedale	Fine-loamy, siliceous, thermic Rhodic Paleudults
Lucy	Loamy, siliceous, thermic Arenic Paleudults
McLaurin	Coarse-loamy, siliceous, thermic Typic Paleudults
Nugent	Sandy, siliceous, thermic Typic Udifluvents
Petal	Fine-loamy, siliceous, thermic Typic Paleudalfs
Prentiss	Coarse-loamy, siliceous, thermic Glossic Fragiudults
Ruston	Fine-loamy, siliceous, thermic Typic Paleudults
Saffell	Loamy-skeletal, siliceous, thermic Typic Hapludults
Savannah	Fine-loamy, siliceous, thermic Typic Fragiudults
Smithdale	Fine-loamy, siliceous, thermic Typic Hapludults
Stough	Coarse-loamy, siliceous, thermic Fragiaquic Paleudults
Susquehanna	Fine, montmorillonitic, thermic Vertic Paleudalfs

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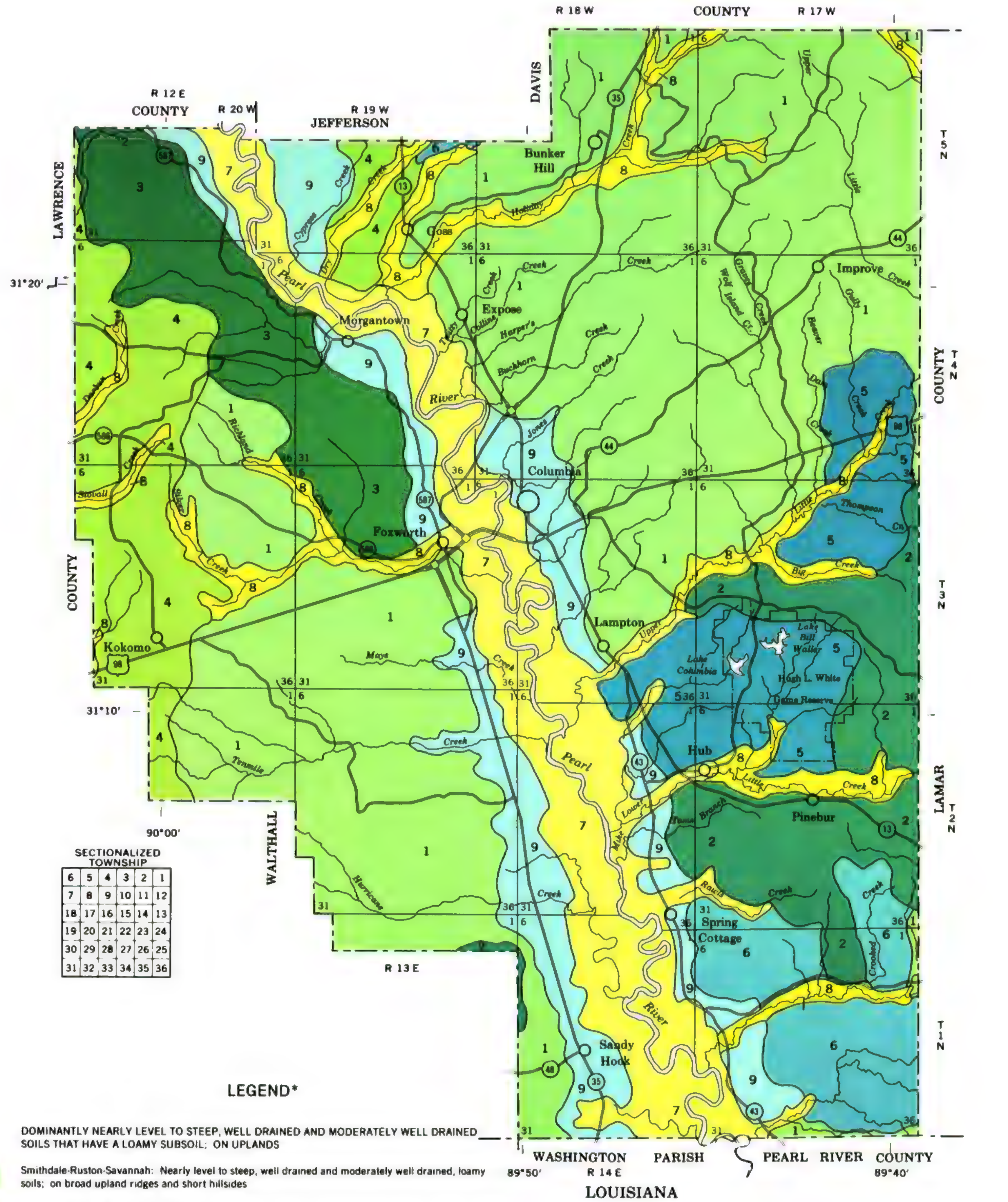


LEGEND*

DOMINANTLY NEARLY LEVEL TO STEEP, WELL DRAINED AND MODERATELY WELL DRAINED SOILS THAT HAVE A LOAMY SUBSOIL; ON UPLANDS

1 Smithdale-Ruston-Savannah: Nearly level to steep, well drained and moderately well drained, loamy soils; on broad upland ridges and short hillsides

2 Smithdale-Lucy-Ruston: Gently sloping to steep, well drained, loamy and sandy soils; on narrow upland ridges and long hillsides

3 Smithdale-Saffell-Lucy: Sloping to steep, well drained, loamy, gravelly, and sandy soils; on narrow upland ridges and long hillsides

4 Savannah-Ruston-Smithdale: Nearly level to sloping, moderately well drained and well drained, loamy soils; on broad upland ridges and short hillsides

DOMINANTLY NEARLY LEVEL TO GENTLY SLOPING, SOMEWHAT POORLY DRAINED AND WELL DRAINED SOILS THAT HAVE A LOAMY SUBSOIL; ON UPLANDS

5 Falkner-Benndale: Nearly level to gently sloping, somewhat poorly drained and well drained, silty and loamy soils; on broad upland ridges and short hillsides

DOMINANTLY GENTLY SLOPING TO STEEP, MODERATELY WELL DRAINED AND SOMEWHAT POORLY DRAINED, LOAMY SOILS THAT HAVE A LOAMY OR CLAYEY SUBSOIL; ON UPLANDS

6 Petal-Susquehanna: Gently sloping to steep, moderately well drained and somewhat poorly drained, loamy soils; on broad upland ridges and short hillsides

DOMINANTLY NEARLY LEVEL, WELL DRAINED TO POORLY DRAINED SOILS THAT HAVE A LOAMY OR SILTY SUBSOIL; ON BROAD FLOOD PLAINS

7 Jena-Cascilla-Chenneby: Nearly level, well drained and somewhat poorly drained, loamy and silty soils; on broad flood plains

8 Bibb-Jena: Nearly level, poorly drained and well drained, silty and loamy soils; on narrow flood plains

DOMINANTLY NEARLY LEVEL, WELL DRAINED AND SOMEWHAT POORLY DRAINED SOILS THAT HAVE A LOAMY SUBSOIL; ON BROAD STREAM TERRACES

9 Latonia-Cahaba-Stough: Nearly level, well drained and somewhat poorly drained, loamy soils; on broad stream terraces

*The texture giving the descriptive heading refers to the surface layer of the major soils in each map unit.

Compiled 1983

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION
MARION COUNTY SOIL AND WATER CONSERVATION DISTRICT

GENERAL SOIL MAP

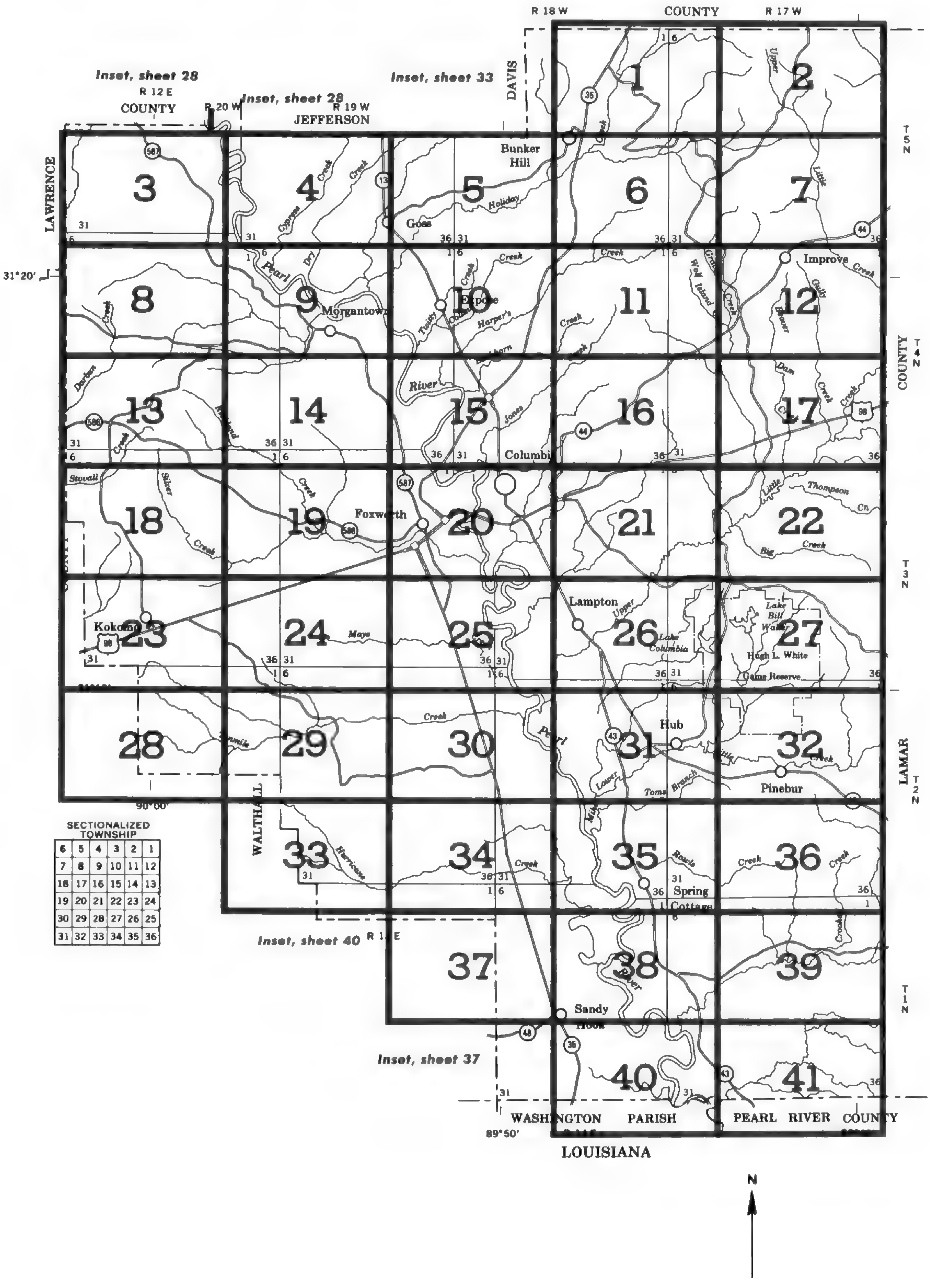
MARION COUNTY, MISSISSIPPI

Scale 1:190,080

1 0 1 2 3 Miles

1 0 3 6 Km

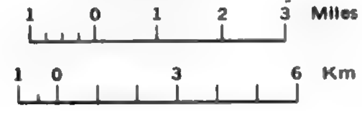
Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



INDEX TO MAP SHEETS

MARION COUNTY, MISSISSIPPI

Scale 1:190,080



SOIL LEGEND

The first letter, always a capital, is the initial letter of the soil name. The second letter is a capital if the mapping unit is broadly defined 1/; otherwise, it is a small letter. The third letter, if used, is always a capital and shows the slope. Symbols without slope letters are those of nearly level soils or miscellaneous areas, or broadly defined mapping units.

SYMBOL	NAME
BaA	Bassfield sandy loam, 0 to 2 percent slopes
Bb	Bibb silt loam, frequently flooded
CaA	Cahaba fine sandy loam, 0 to 2 percent slopes
Cb	Cascilla silt loam, frequently flooded
CC	Cascilla-Chenneby association, frequently flooded
DC	Dorovan-Croatan association, frequently flooded
FaB	Falkner silt loam, 2 to 5 percent slopes
FaC	Falkner silt loam, 5 to 8 percent slopes
FB	Falkner-Benndale association, undulating
Gu	Guyton silt loam, frequently flooded
Je	Jena fine sandy loam, frequently flooded
Jg	Jena-Bigbee complex, frequently flooded
JN	Jena-Nugent association, frequently flooded
Jt	Johnston-Croatan complex, frequently flooded
LaA	Latonia sandy loam, 0 to 2 percent slopes
LuA	Lucedale loam, 0 to 2 percent slopes
MnB	McLaurin fine sandy loam, 2 to 5 percent slopes
MnC	McLaurin fine sandy loam, 5 to 8 percent slopes
Ng	Nugent sand, frequently flooded
PS	Petal-Susquehanna association, rolling
Pt	Pits-Udorthents complex
PxA	Prentiss fine sandy loam, 0 to 2 percent slopes
RuB	Ruston sandy loam, 2 to 5 percent slopes
RuC	Ruston sandy loam, 5 to 8 percent slopes
SaF	Saffell gravelly sandy loam, 8 to 40 percent slopes
ShA	Savannah fine sandy loam, 0 to 2 percent slopes
ShB	Savannah fine sandy loam, 2 to 5 percent slopes
ShC	Savannah fine sandy loam, 5 to 8 percent slopes
SkE	Smithdale sandy loam, 8 to 15 percent slopes
SkF	Smithdale sandy loam, 15 to 35 percent slopes
SL	Smithdale-Lucy association, hilly
SS	Smithdale-Saffell-Lucy association, hilly
StA	Stough fine sandy loam, 0 to 2 percent slopes

1/ The composition of these units is more variable than that of others in the survey area but has been controlled well enough to be interpreted for the expected use of the soils.

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate
- Federal
- State
- County, farm or ranch

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — Gas
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water, w
- Intermittent — int, i

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — MnC ShC

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

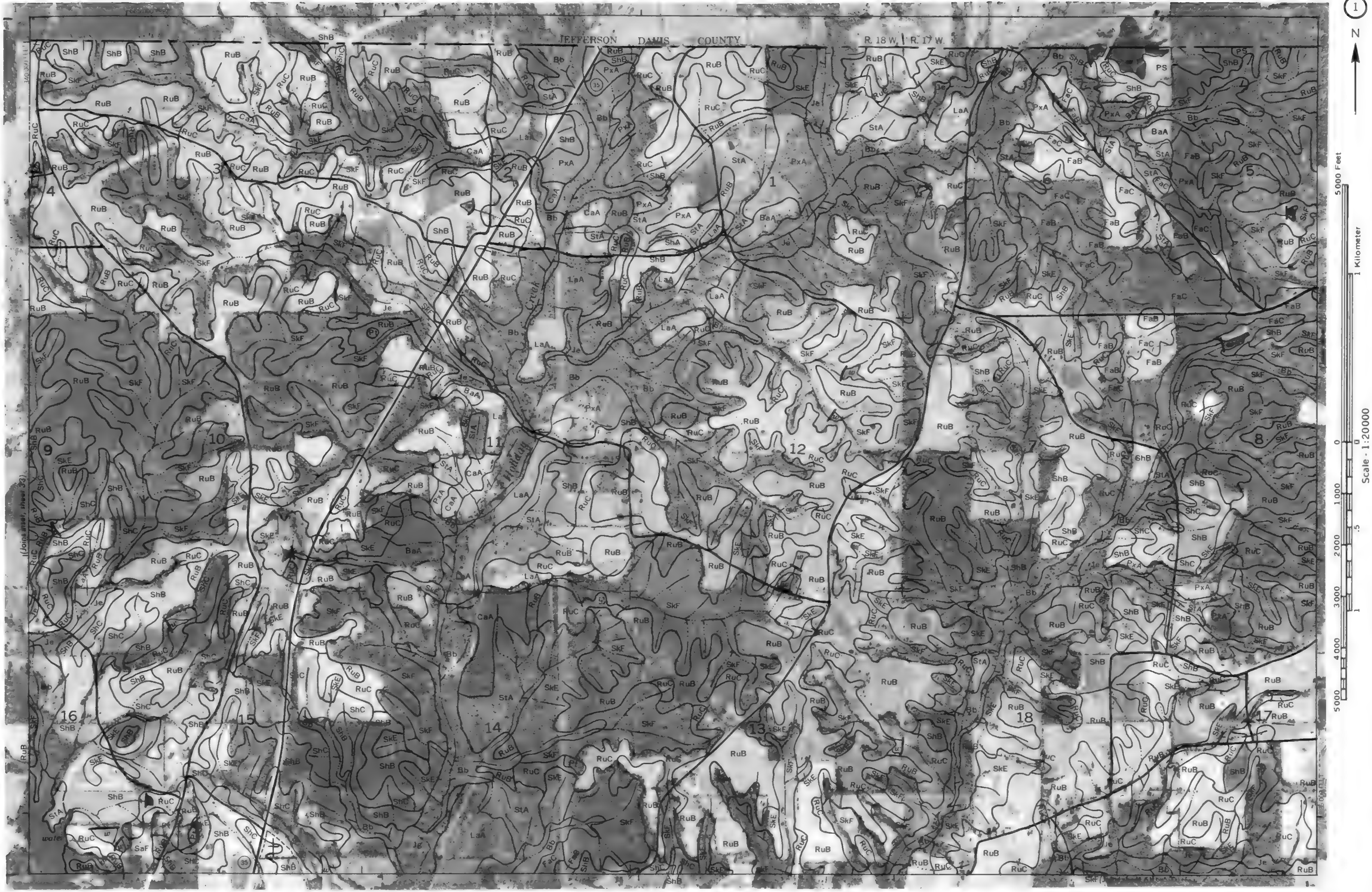
GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown)

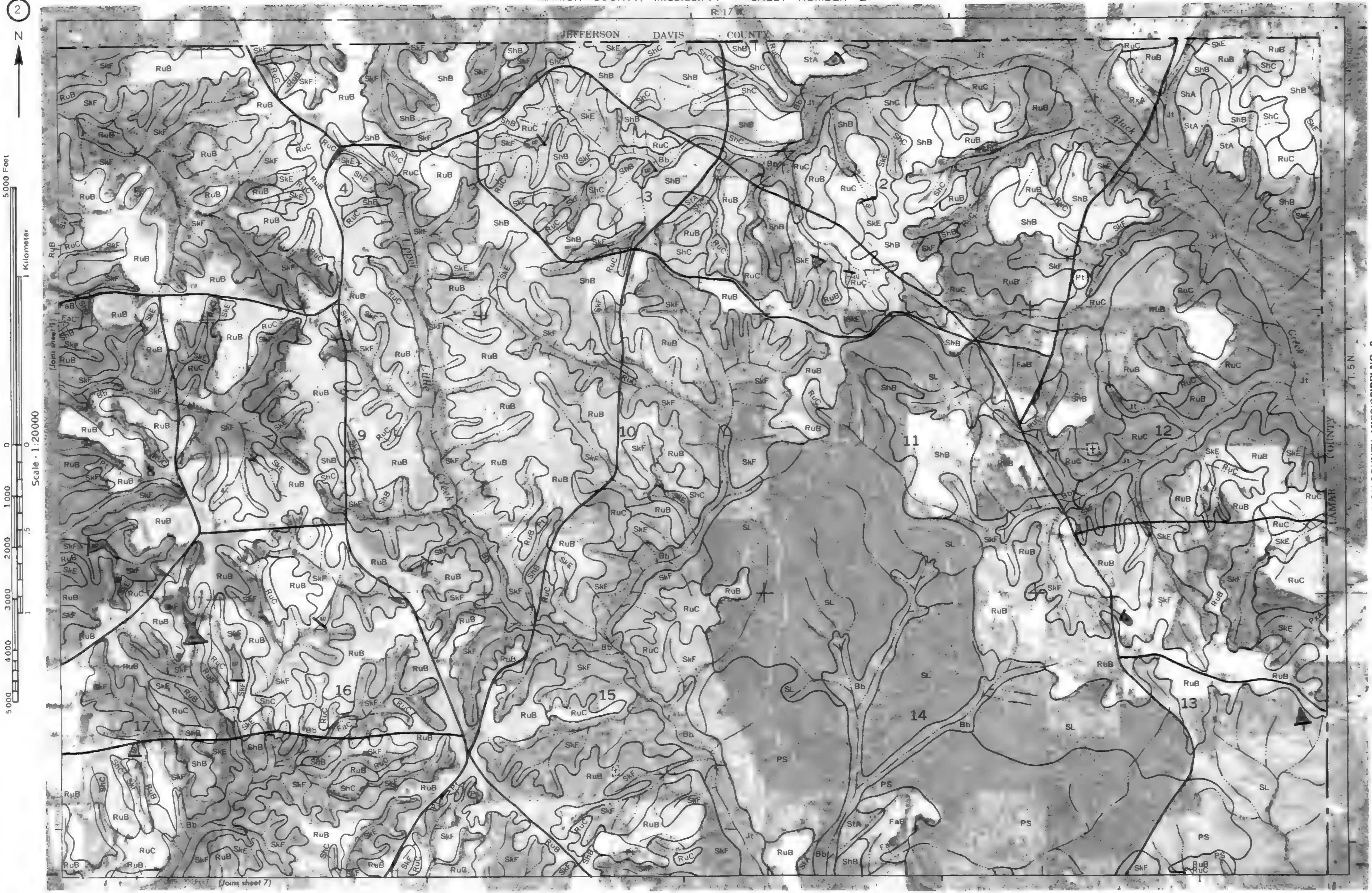
MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot



MARION COUNTY, MISSISSIPPI NO. 1

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



MARION COUNTY, MISSISSIPPI NO. 2

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

3

MARION COUNTY, MISSISSIPPI NO. 3
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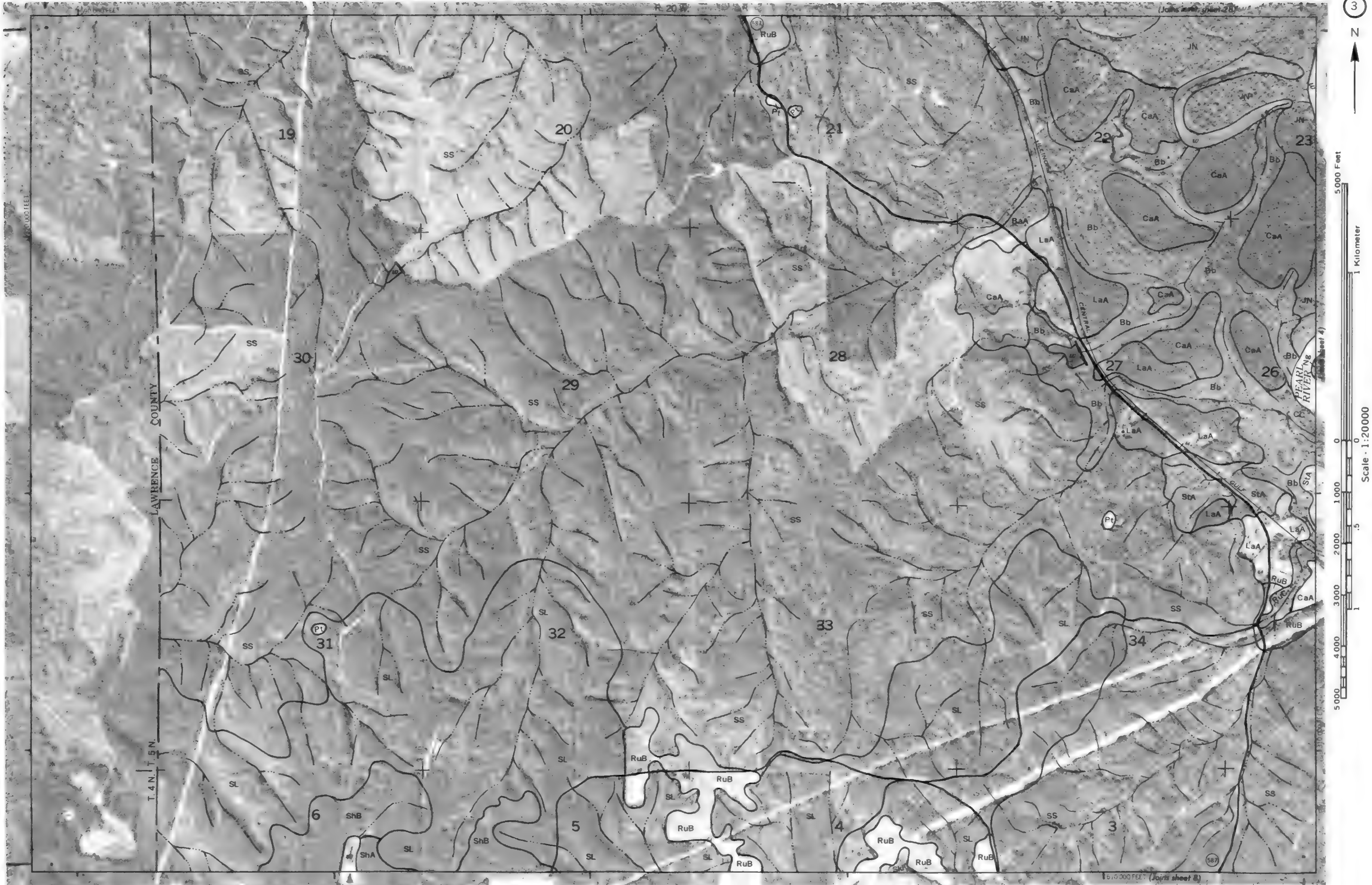

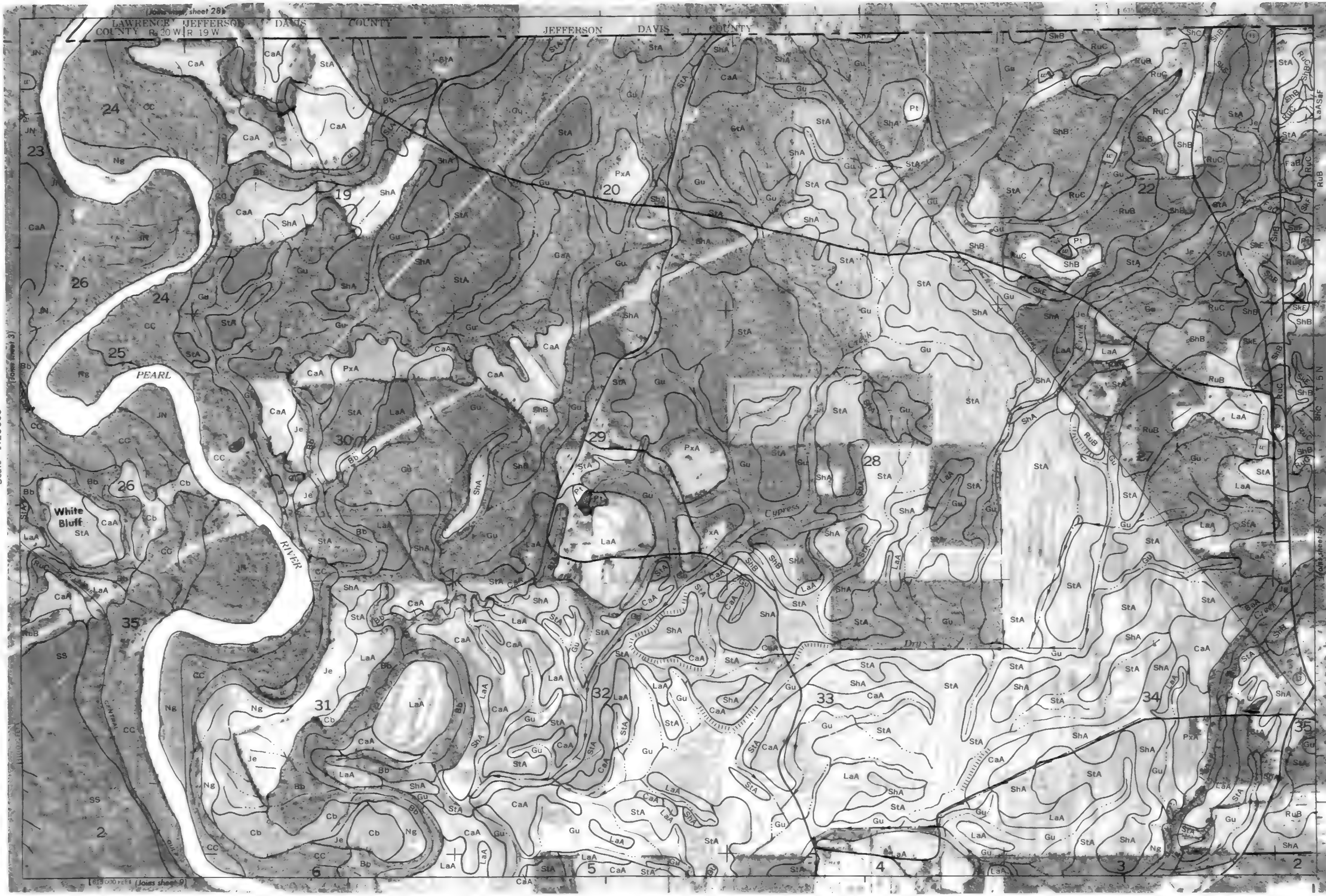

MARION COUNTY, MISSISSIPPI NO. 4

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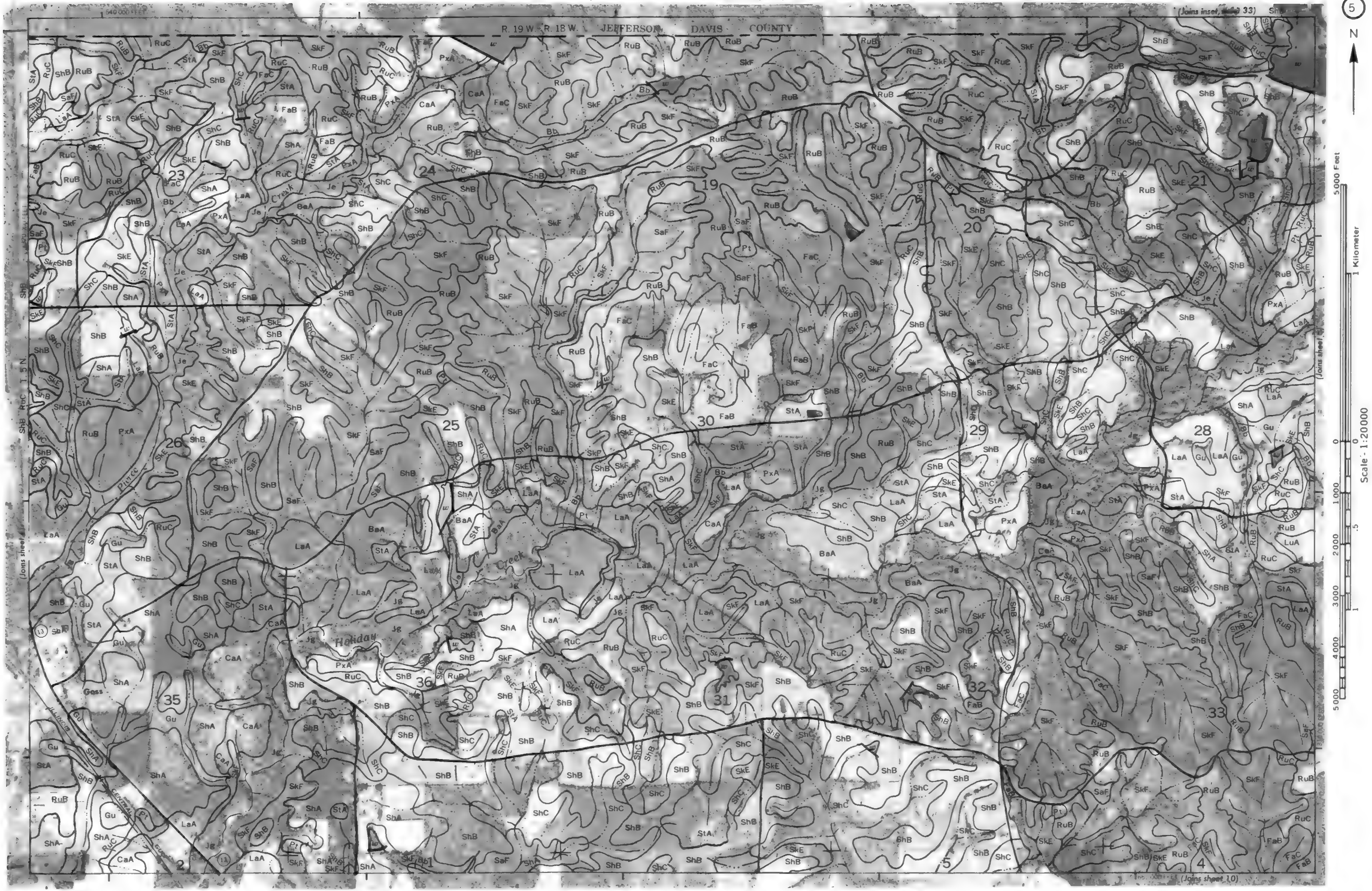

MARION COUNTY, MISSISSIPPI NO. 5
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MARION COUNTY, MISSISSIPPI NO. 6

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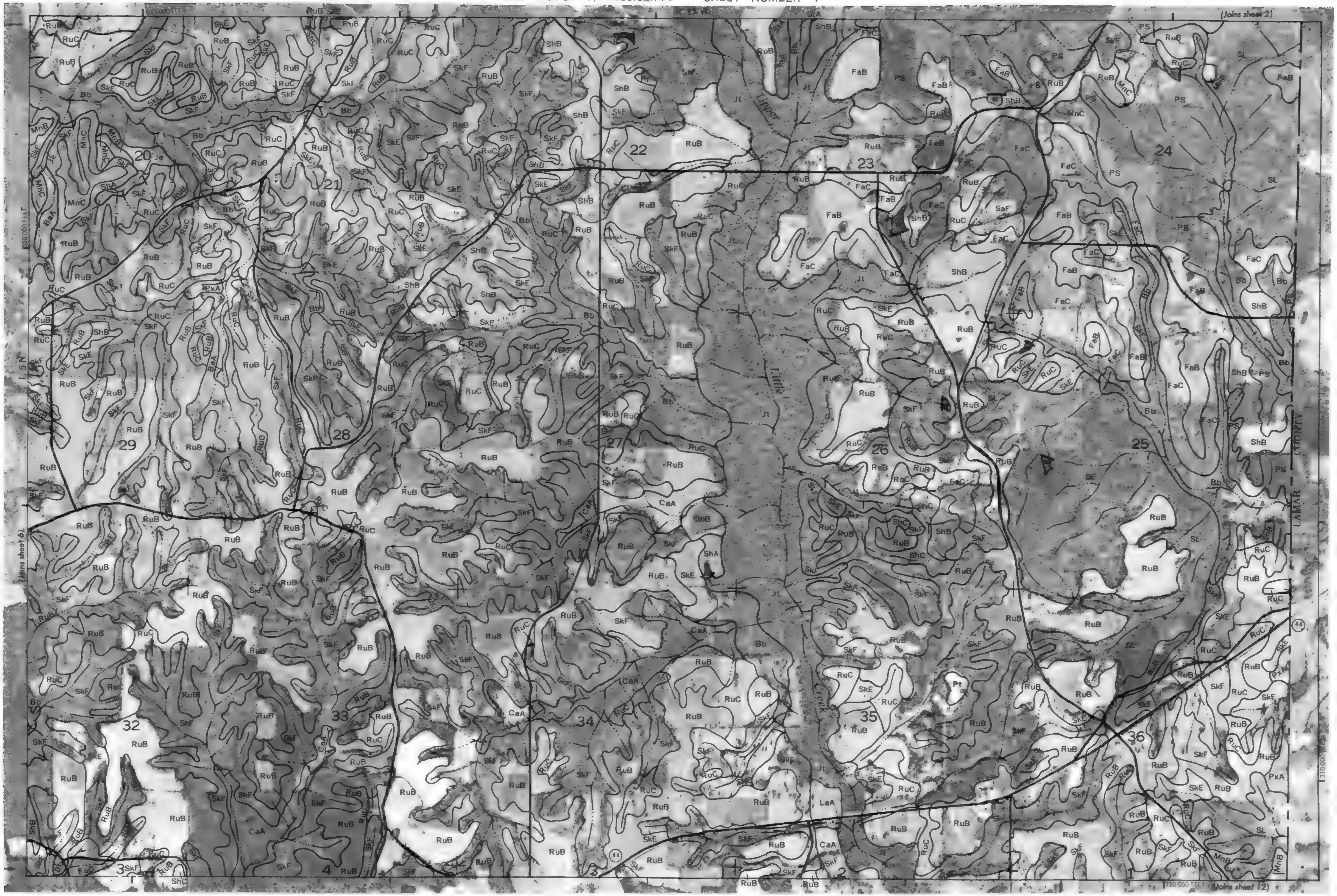

MARION COUNTY, MISSISSIPPI NO. 7

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MARION COUNTY, MISSISSIPPI NO. 8

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MARION COUNTY, MISSISSIPPI NO. 9
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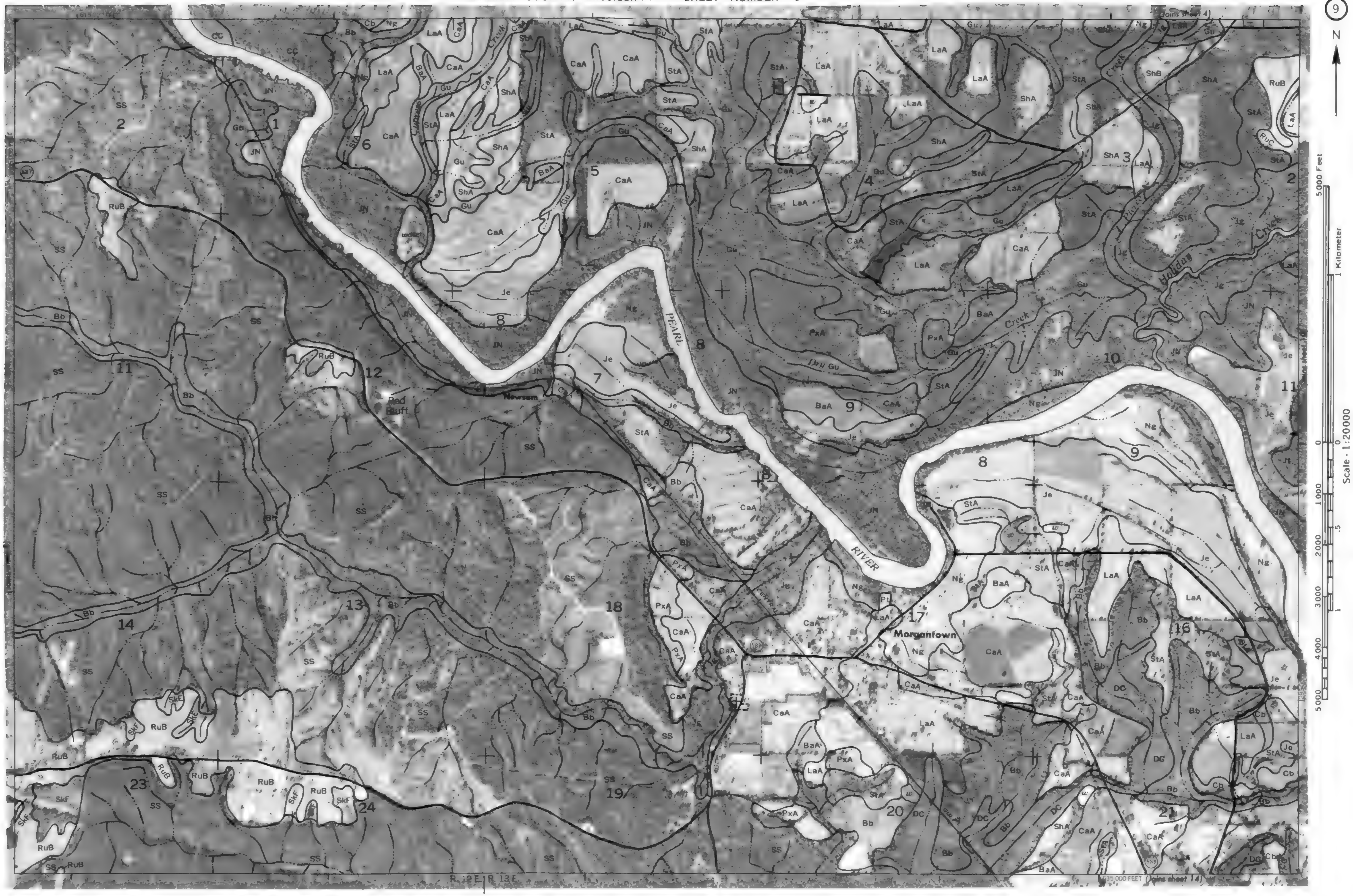

MARION COUNTY, MISSISSIPPI NO. 10

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MARION COUNTY, MISSISSIPPI NO. 11

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(12)

N

5 000 Feet

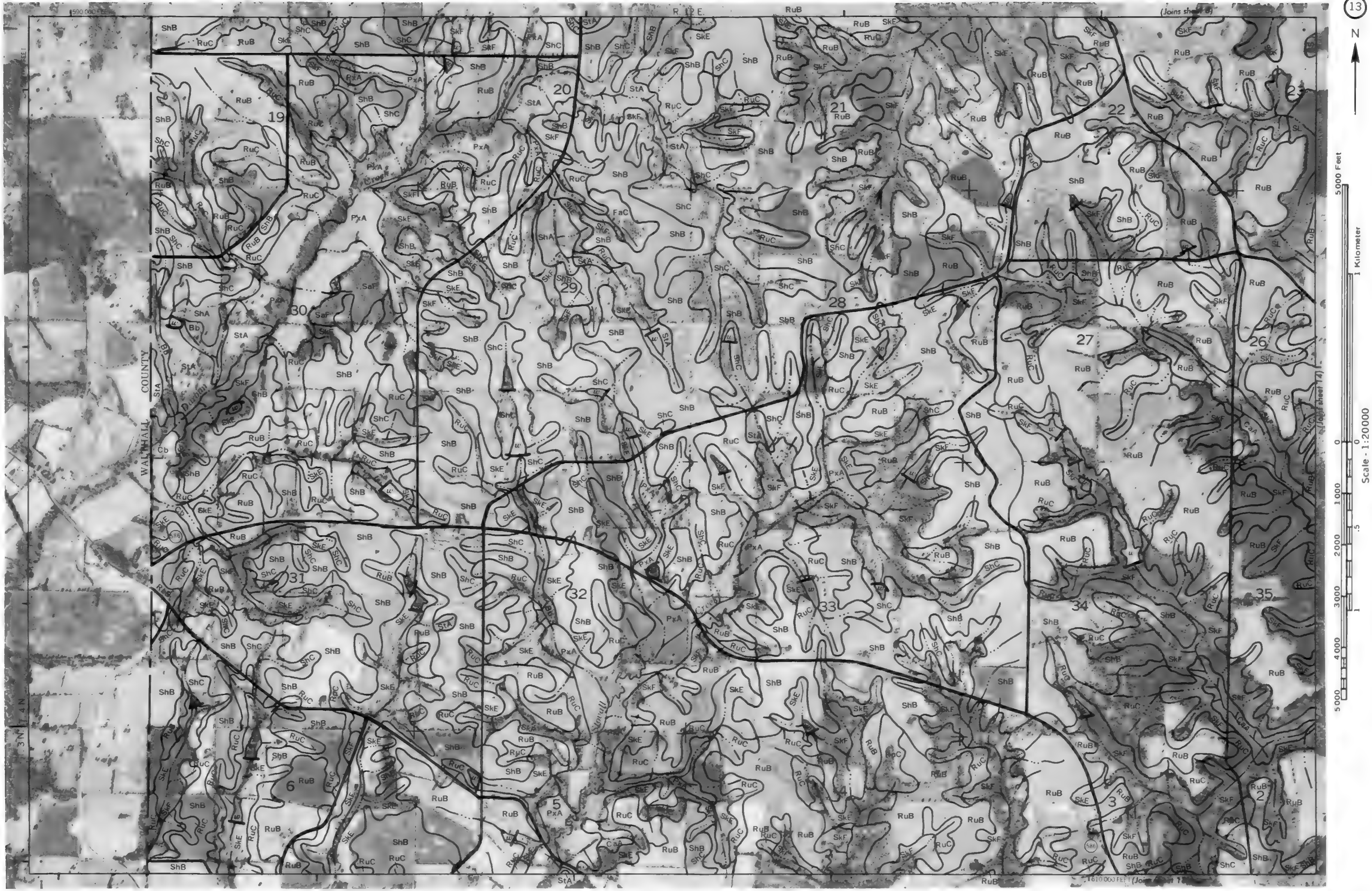
1 Kilometer

Scale - 1:20000

MARION COUNTY, MISSISSIPPI NO. 12

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MARION COUNTY, MISSISSIPPI NO. 13
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



MARION COUNTY, MISSISSIPPI NO. 14

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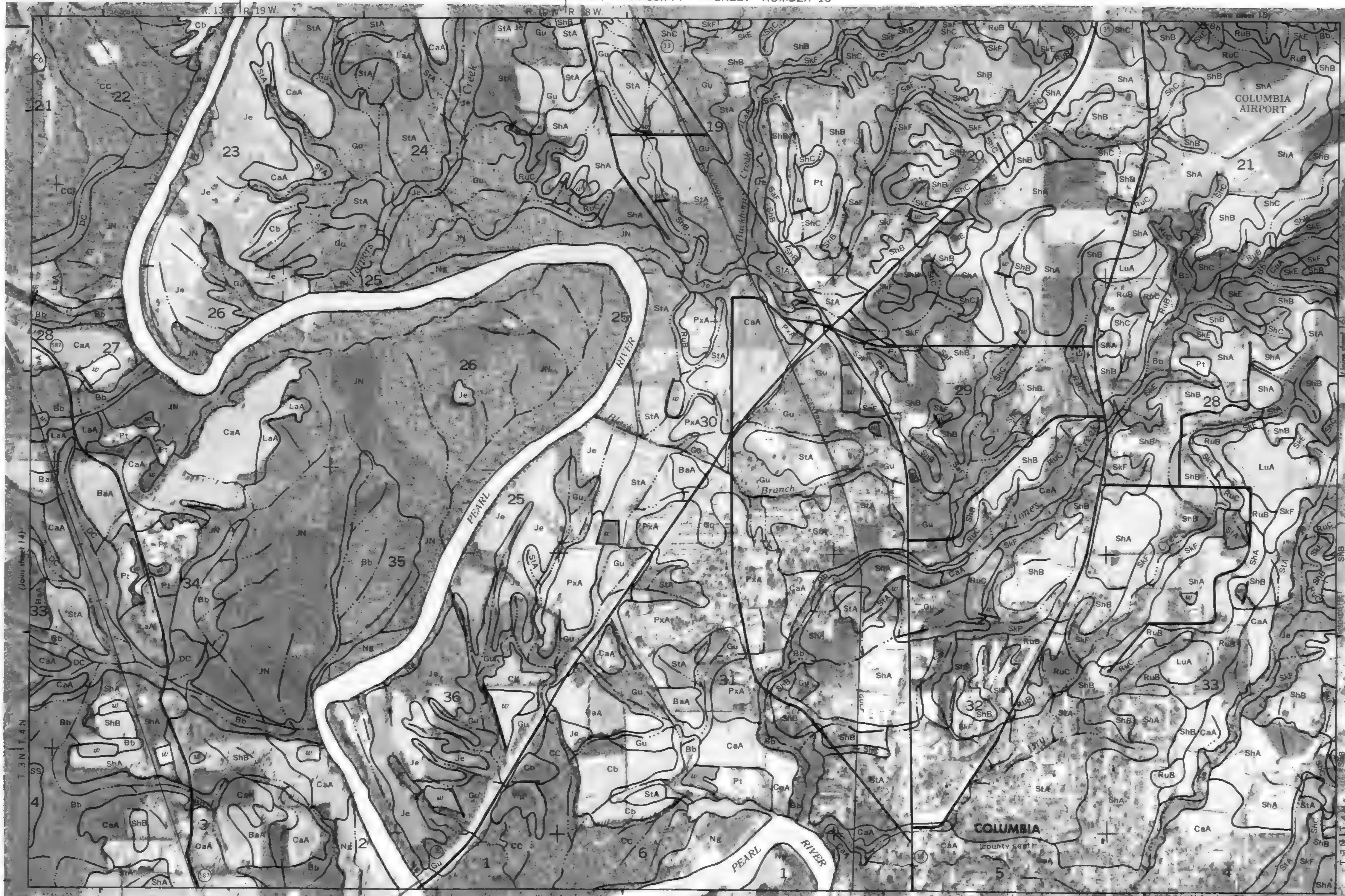

15

N

Scale - 1:20000

1 Kilometer

5000 Feet

MARION COUNTY, MISSISSIPPI NO. 15

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MARION COUNTY, MISSISSIPPI NO. 16

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MARION COUNTY, MISSISSIPPI NO. 17

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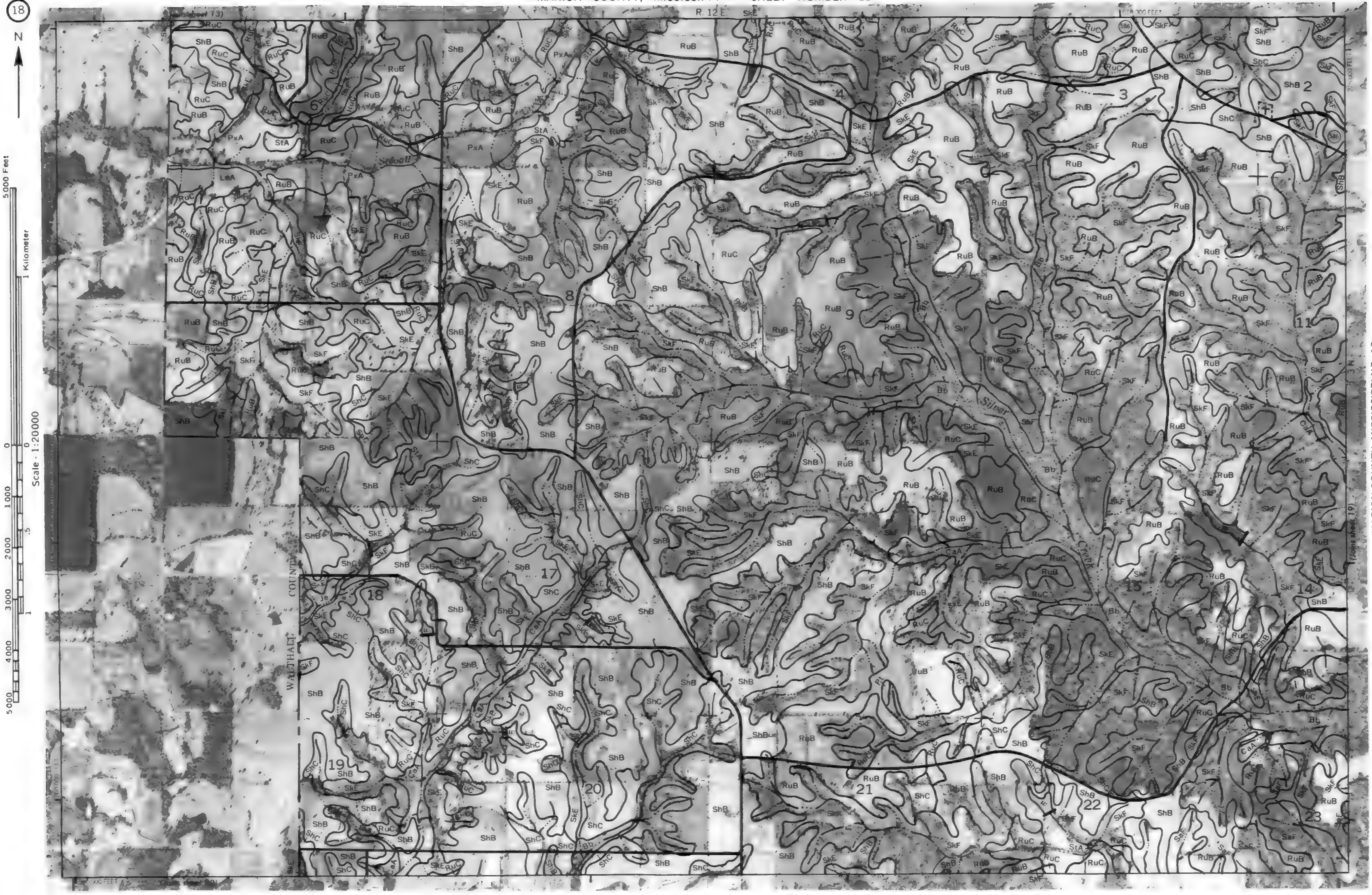

MARION COUNTY, MISSISSIPPI NO. 18
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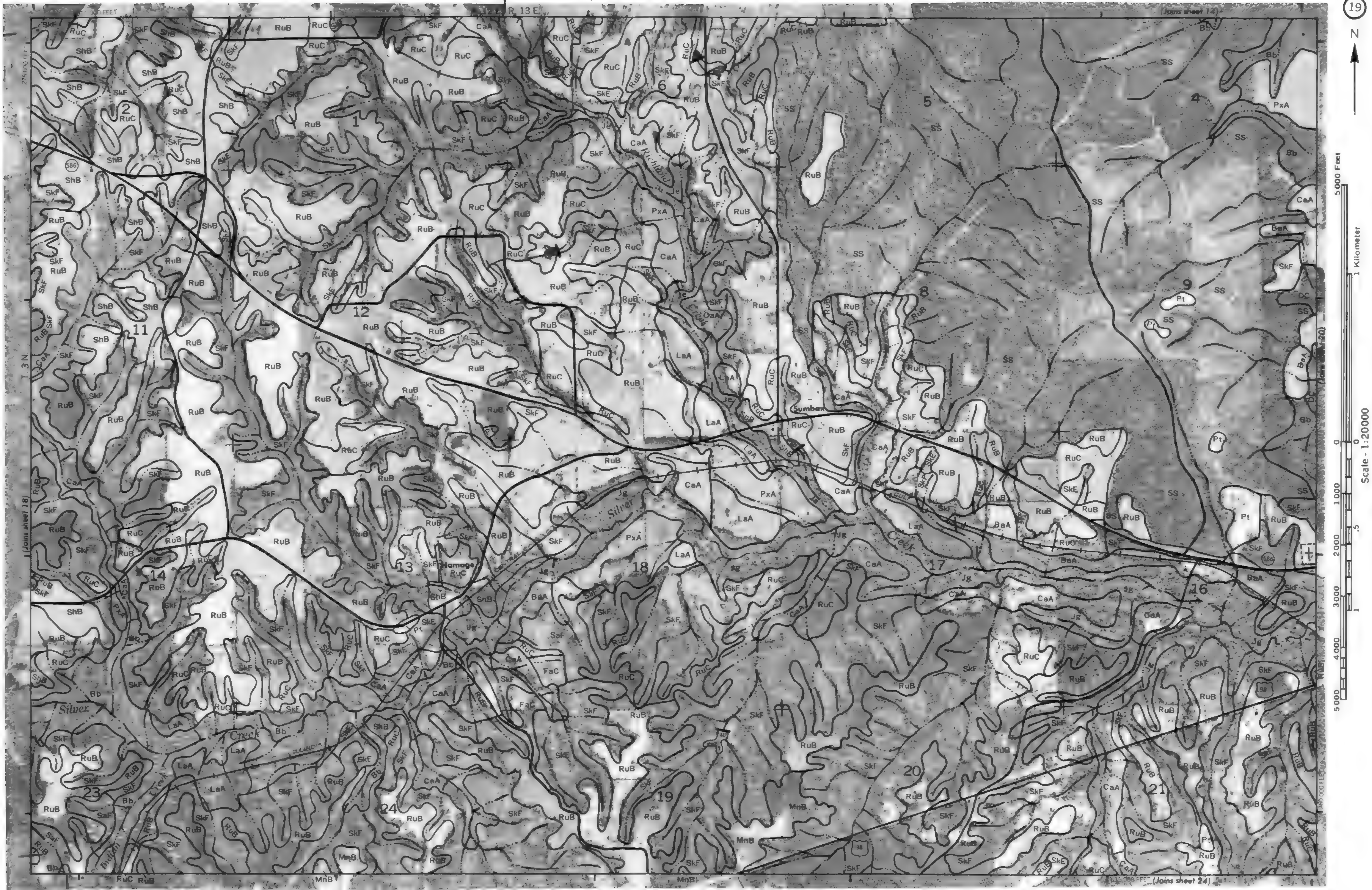

MARION COUNTY, MISSISSIPPI NO. 19
This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MARION COUNTY, MISSISSIPPI NO. 20

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MARION COUNTY, MISSISSIPPI NO. 21
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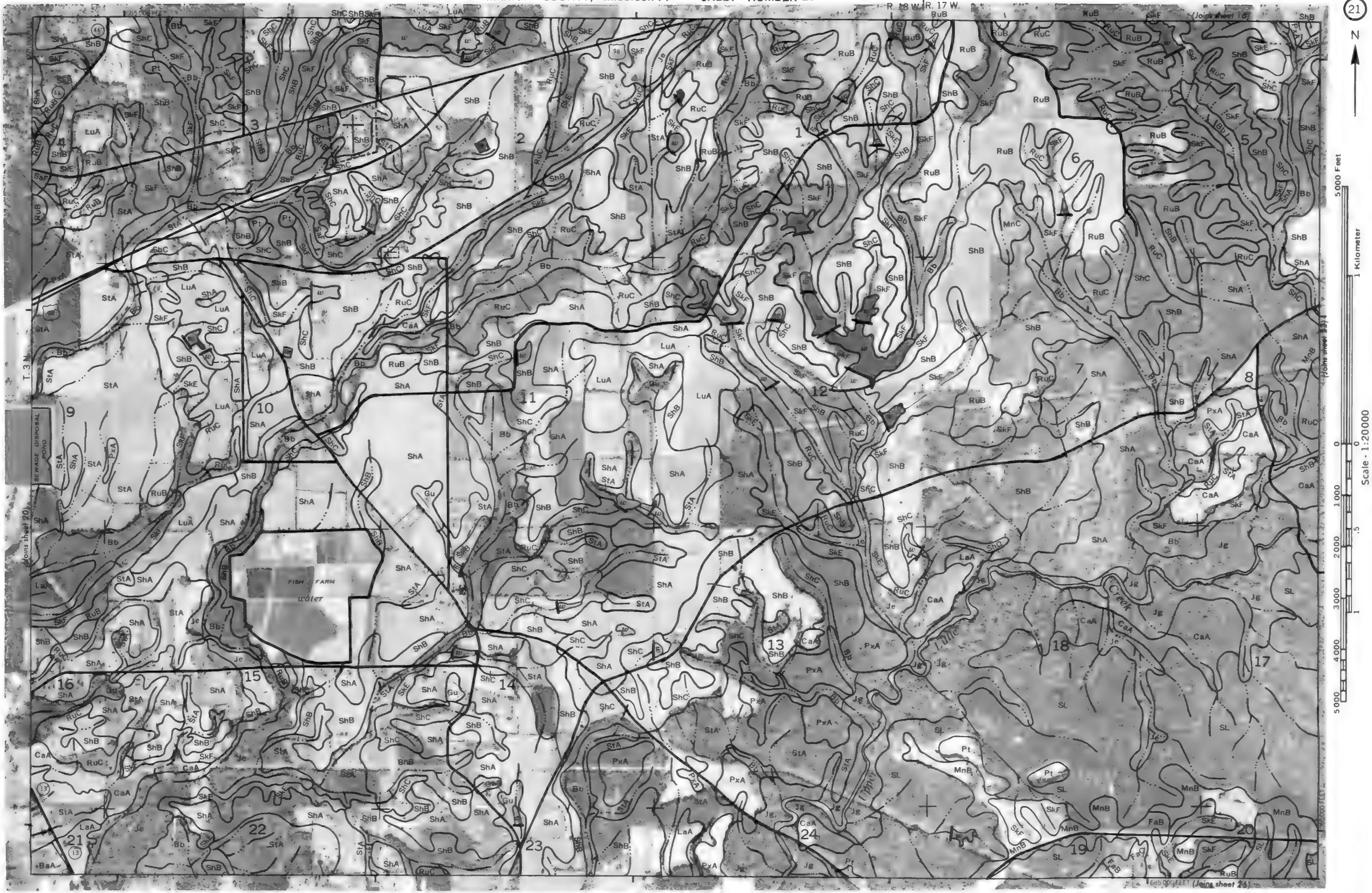

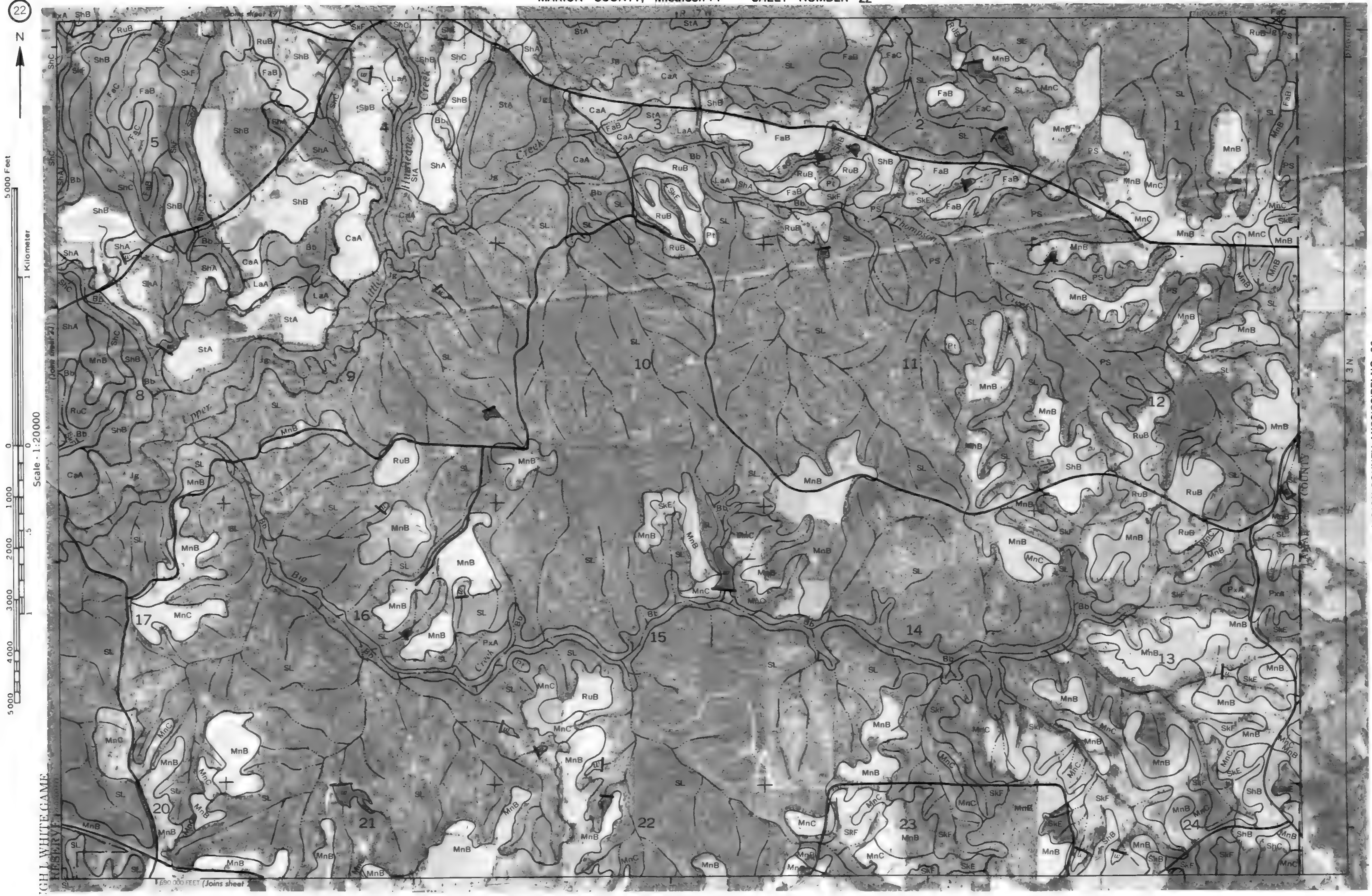

MARION COUNTY, MISSISSIPPI NO. 22

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MARION COUNTY, MISSISSIPPI — SHEET NUMBER 23

MARION COUNTY, MISSISSIPPI NO. 23

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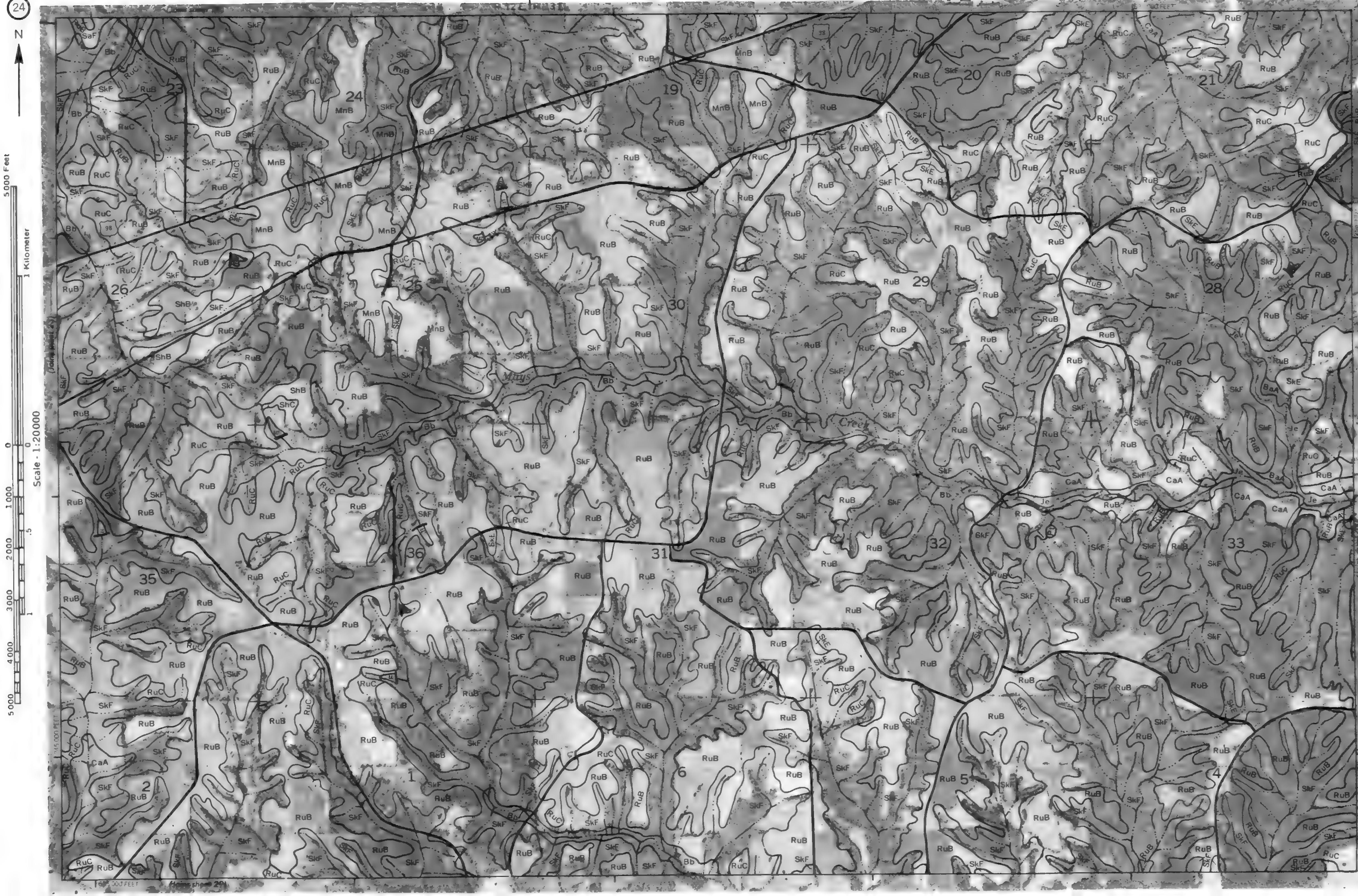

MARION COUNTY, MISSISSIPPI NO. 24

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MARION COUNTY, MISSISSIPPI NO. 25

26

N

5000 Feet

1 Kilometer

Scale - 1:20000

MARION COUNTY, MISSISSIPPI NO. 26

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

(27)

MARION COUNTY, MISSISSIPPI NO. 27

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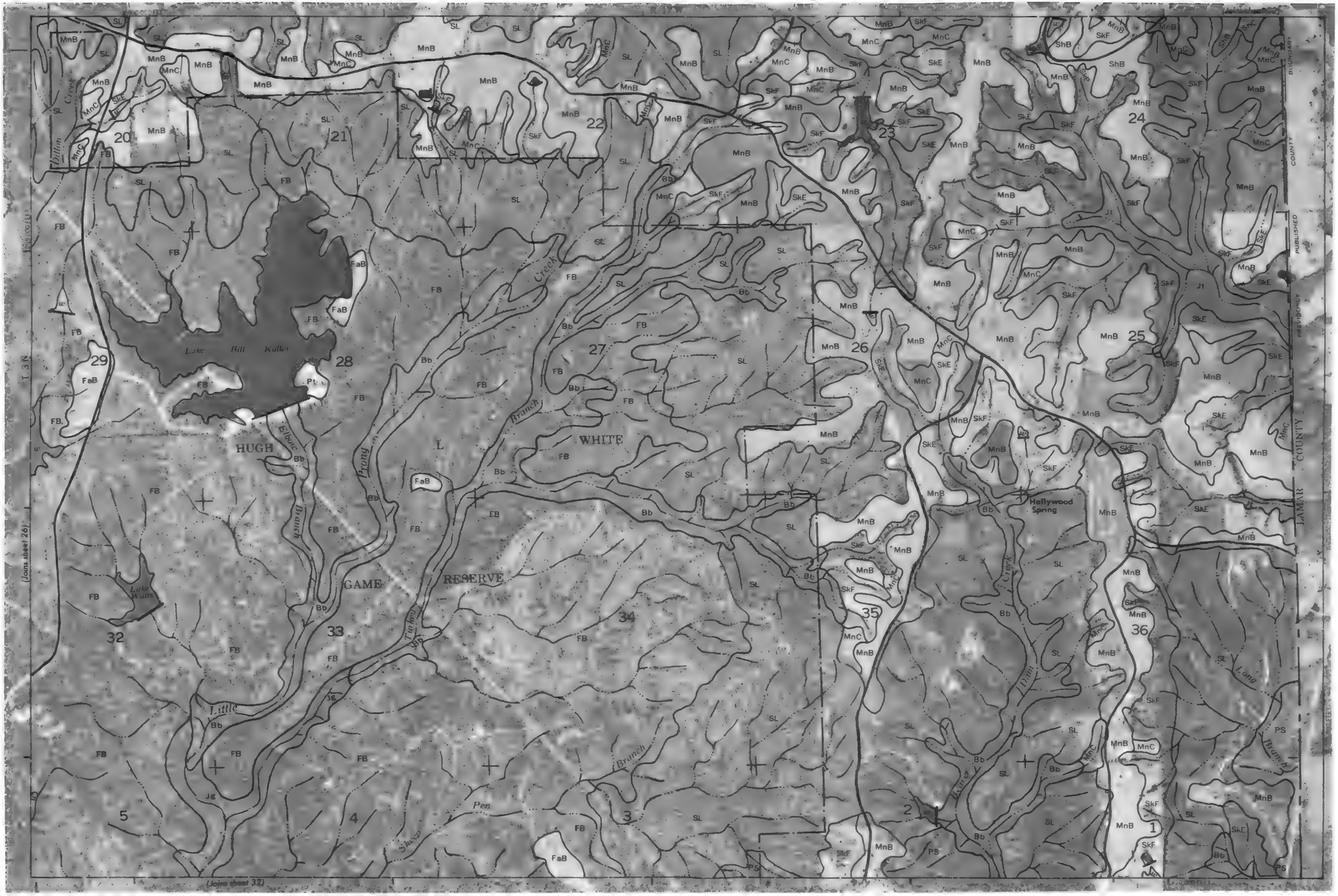


N

5000 Feet

1 Kilometer

Scale - 1:20000

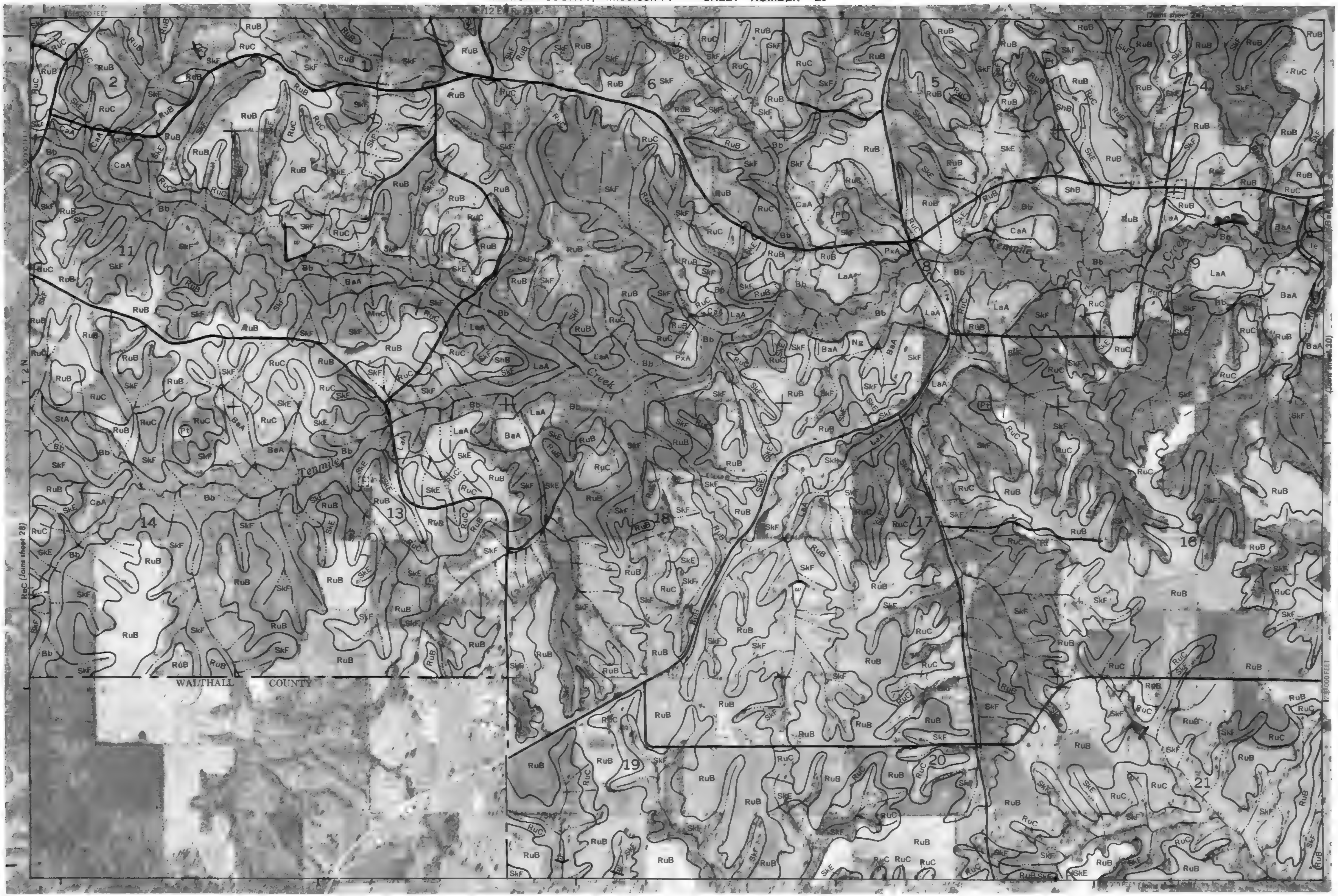
0 1000 2000 3000 4000 5000

0 .5 1

MARION COUNTY, MISSISSIPPI NO. 28

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

29



N

Scale - 1:20000

5000 Feet

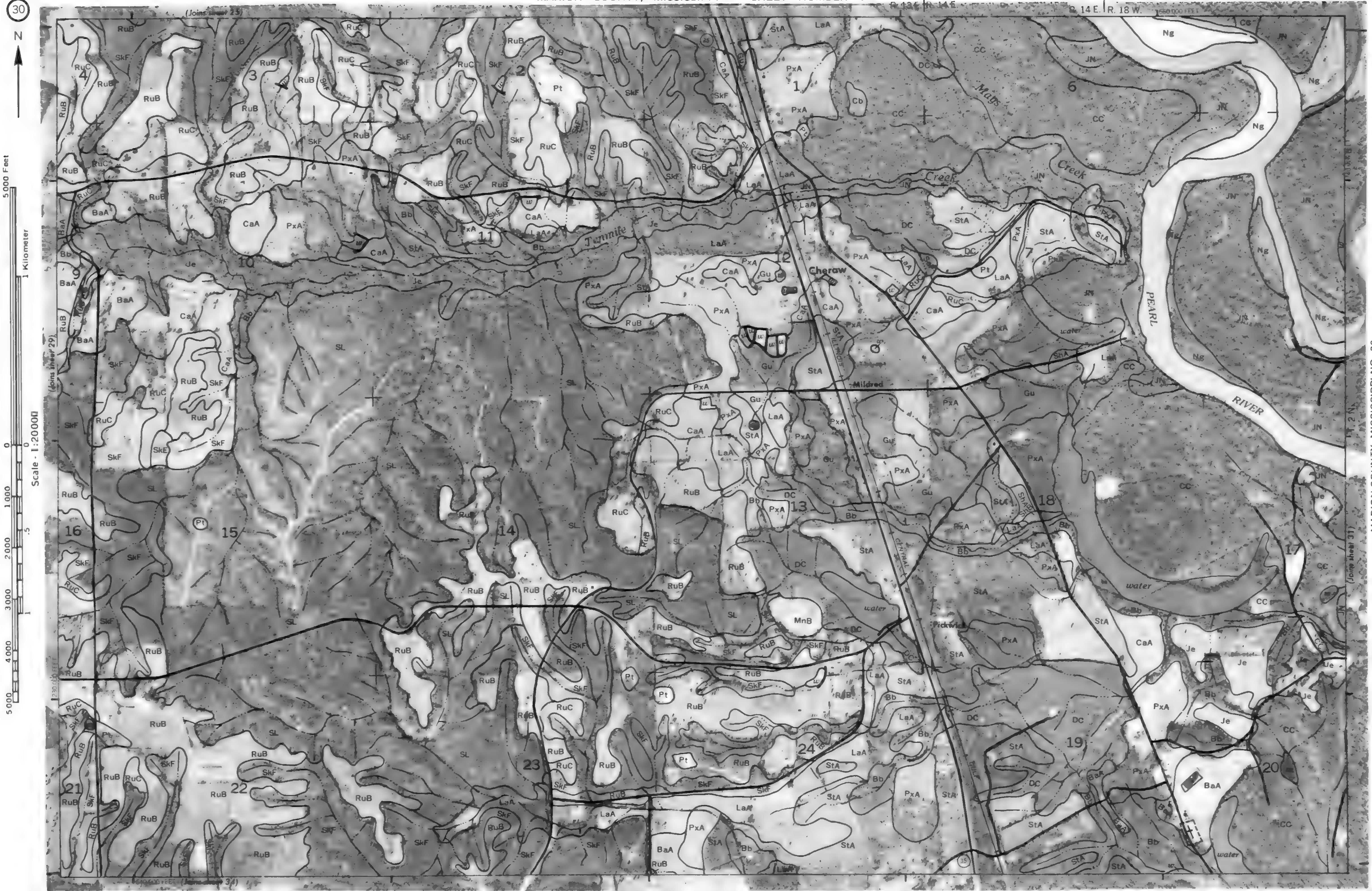
1 Kilometer

0 1000 2000 3000 4000 5000

0 .5 1

MARION COUNTY, MISSISSIPPI NO. 29

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



MARION COUNTY, MISSISSIPPI NO. 30

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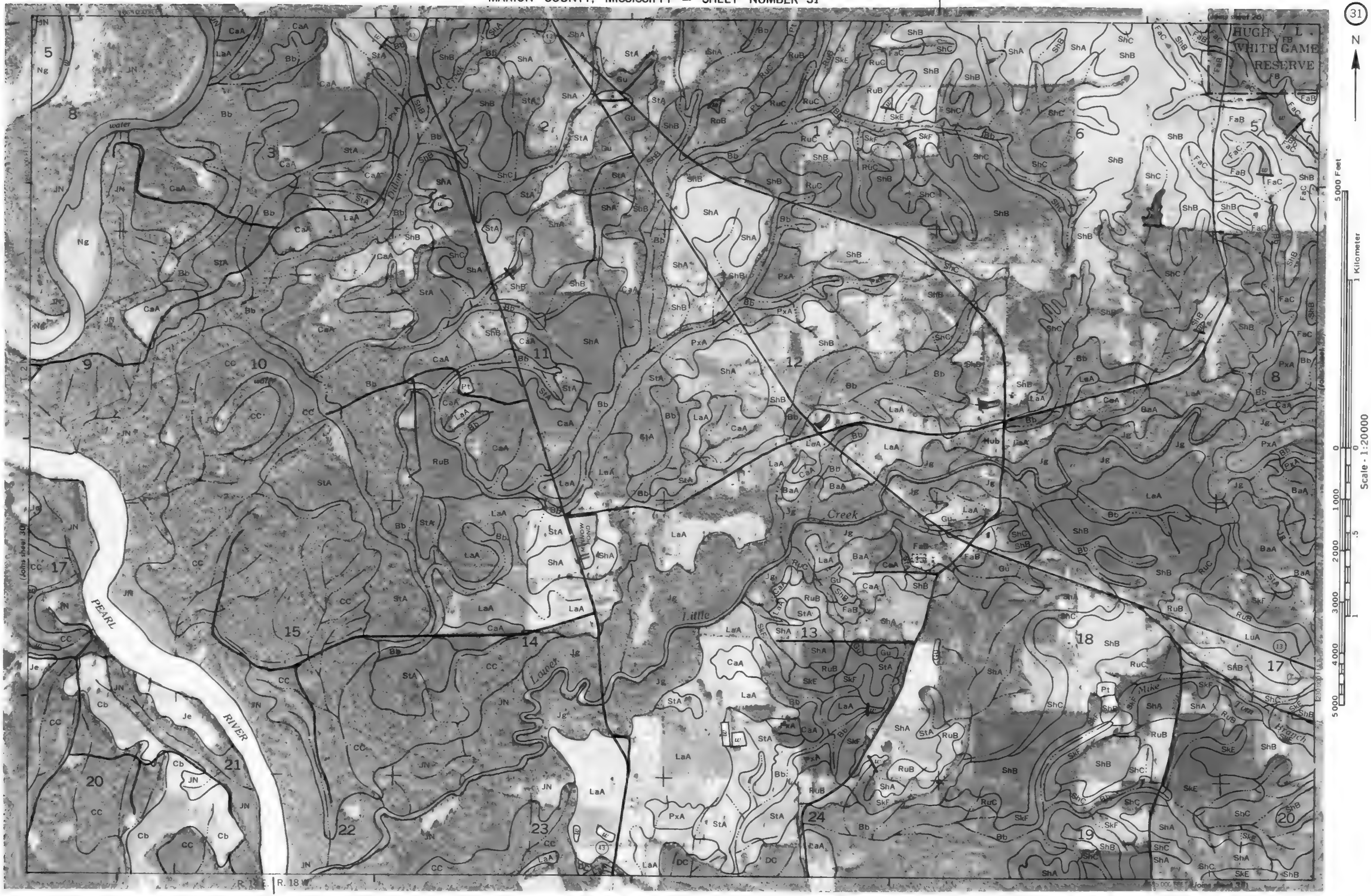

MARION COUNTY, MISSISSIPPI NO. 31
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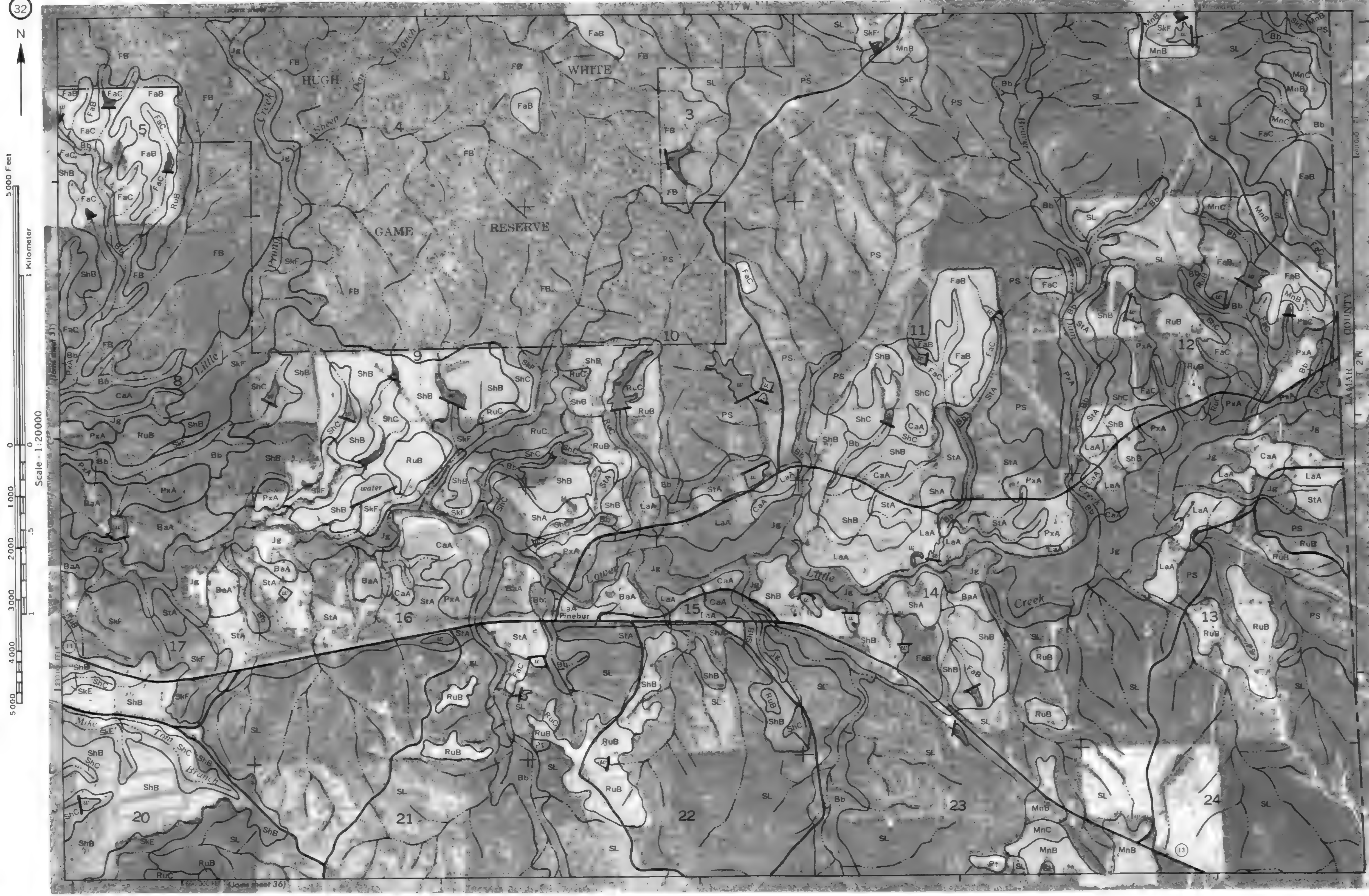

MARION COUNTY, MISSISSIPPI NO. 32
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MARION COUNTY, MISSISSIPPI NO. 33

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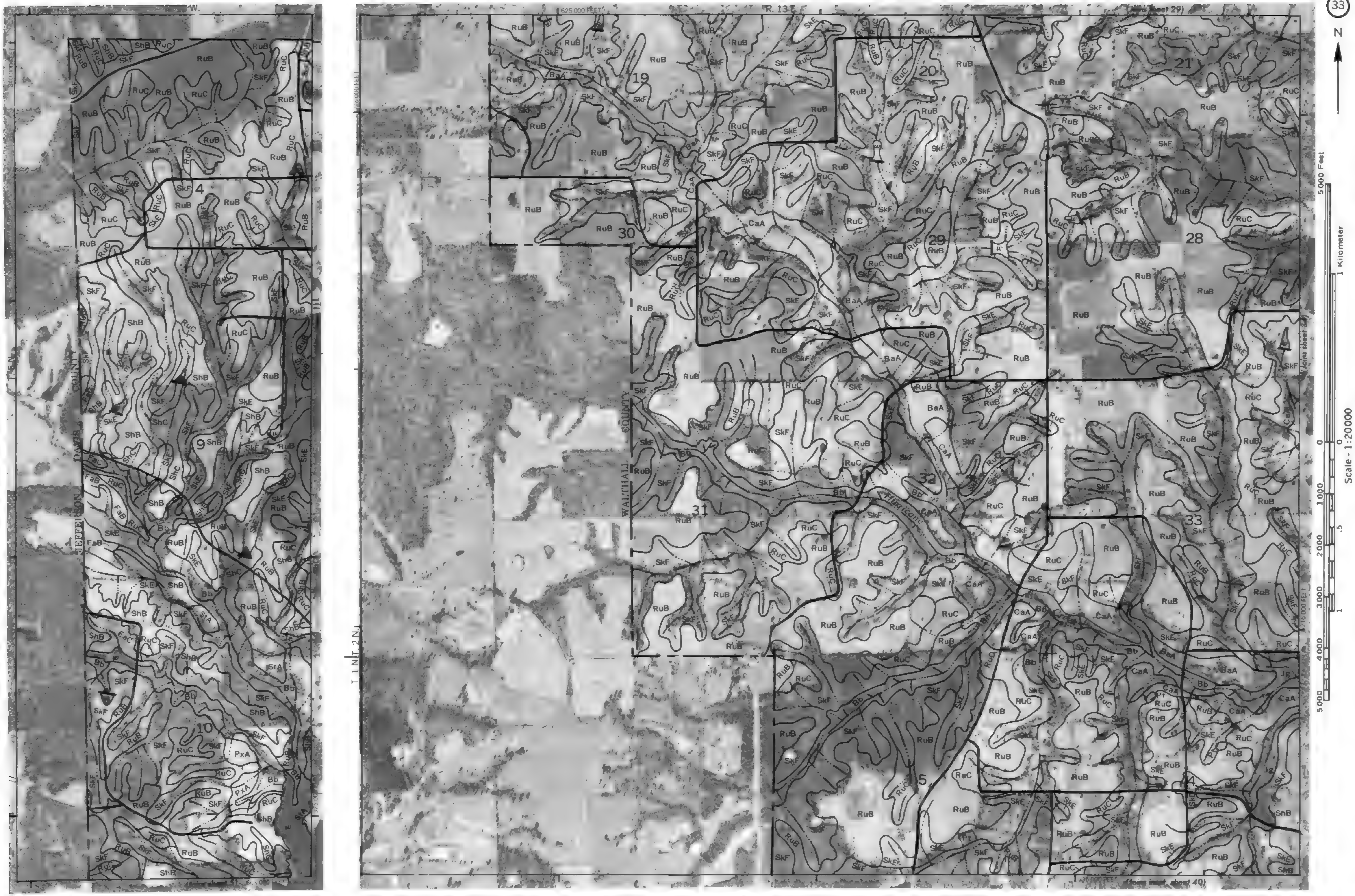

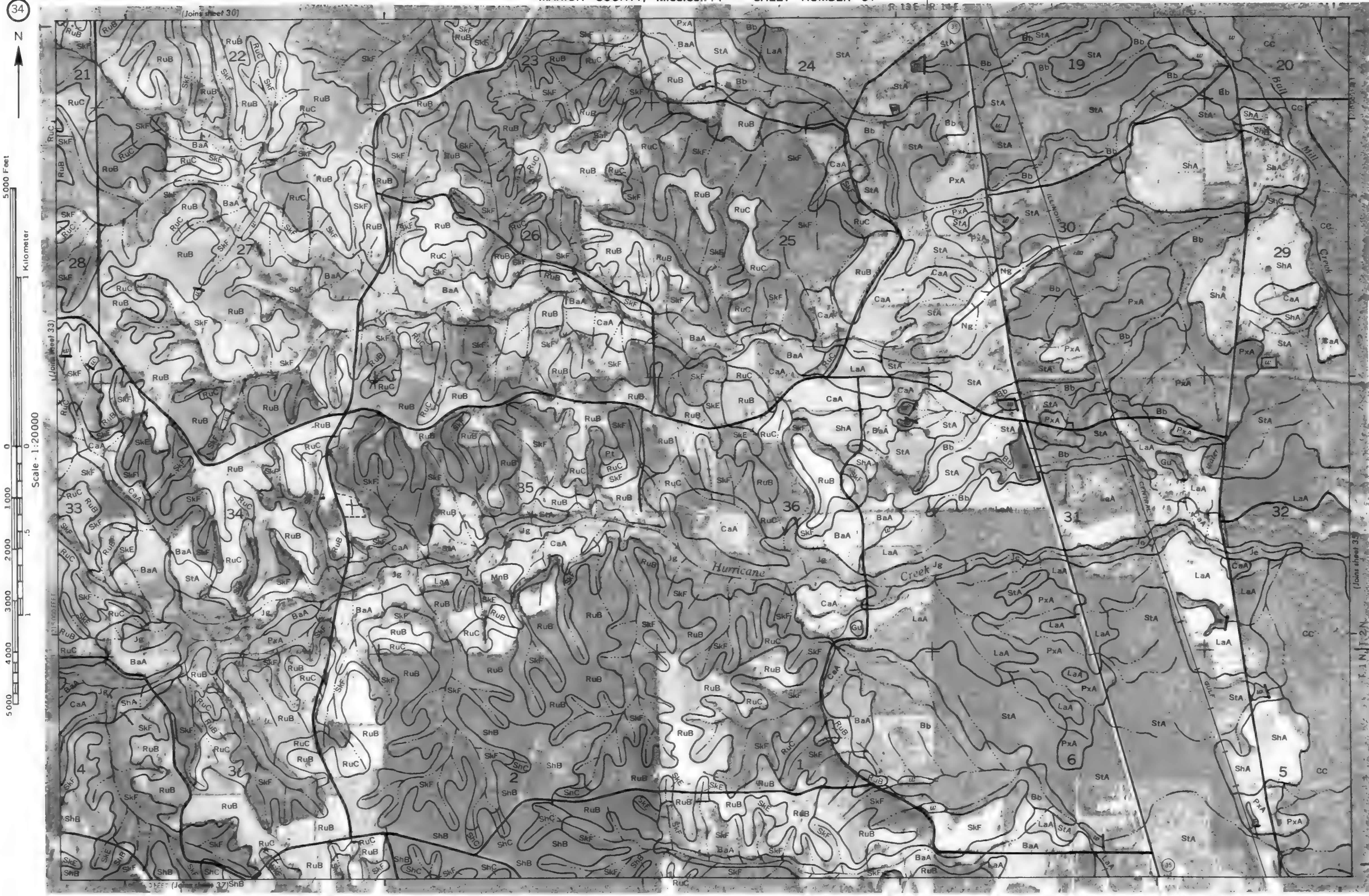

MARION COUNTY, MISSISSIPPI NO. 34

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MARION COUNTY, MISSISSIPPI NO. 35
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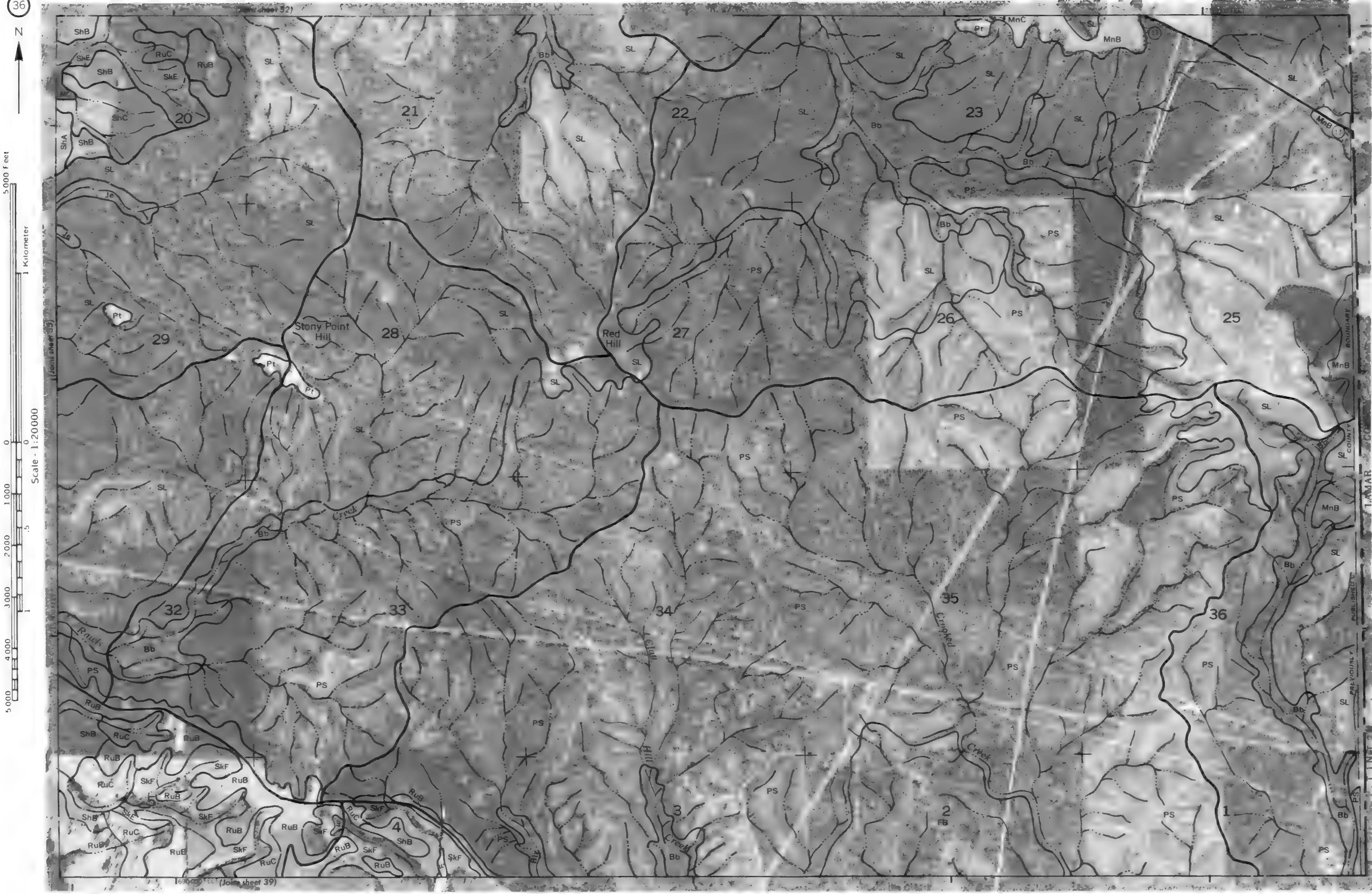

MARION COUNTY, MISSISSIPPI NO. 36

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MARION COUNTY, MISSISSIPPI NO. 37

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MARION COUNTY, MISSISSIPPI NO. 38

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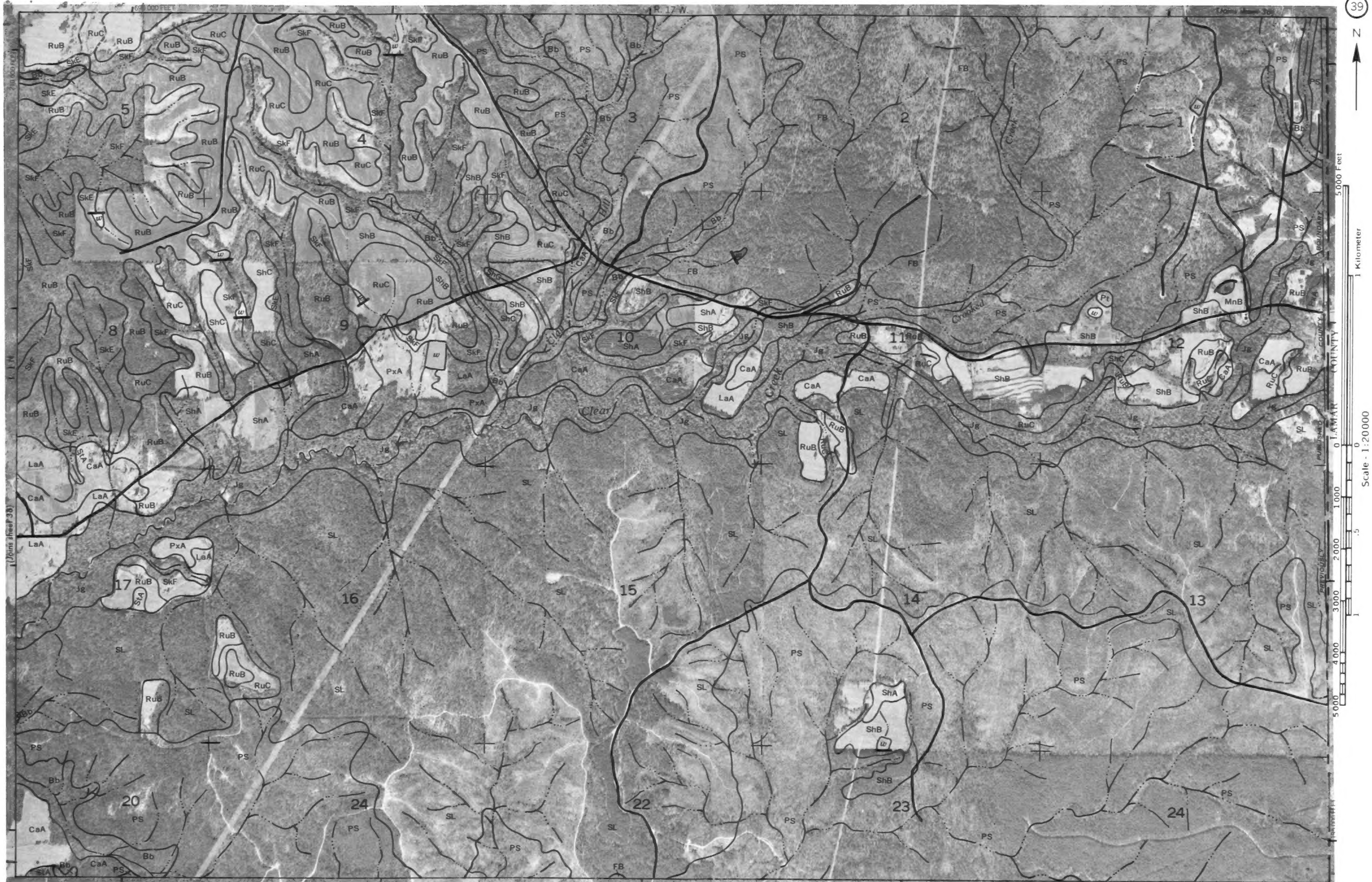
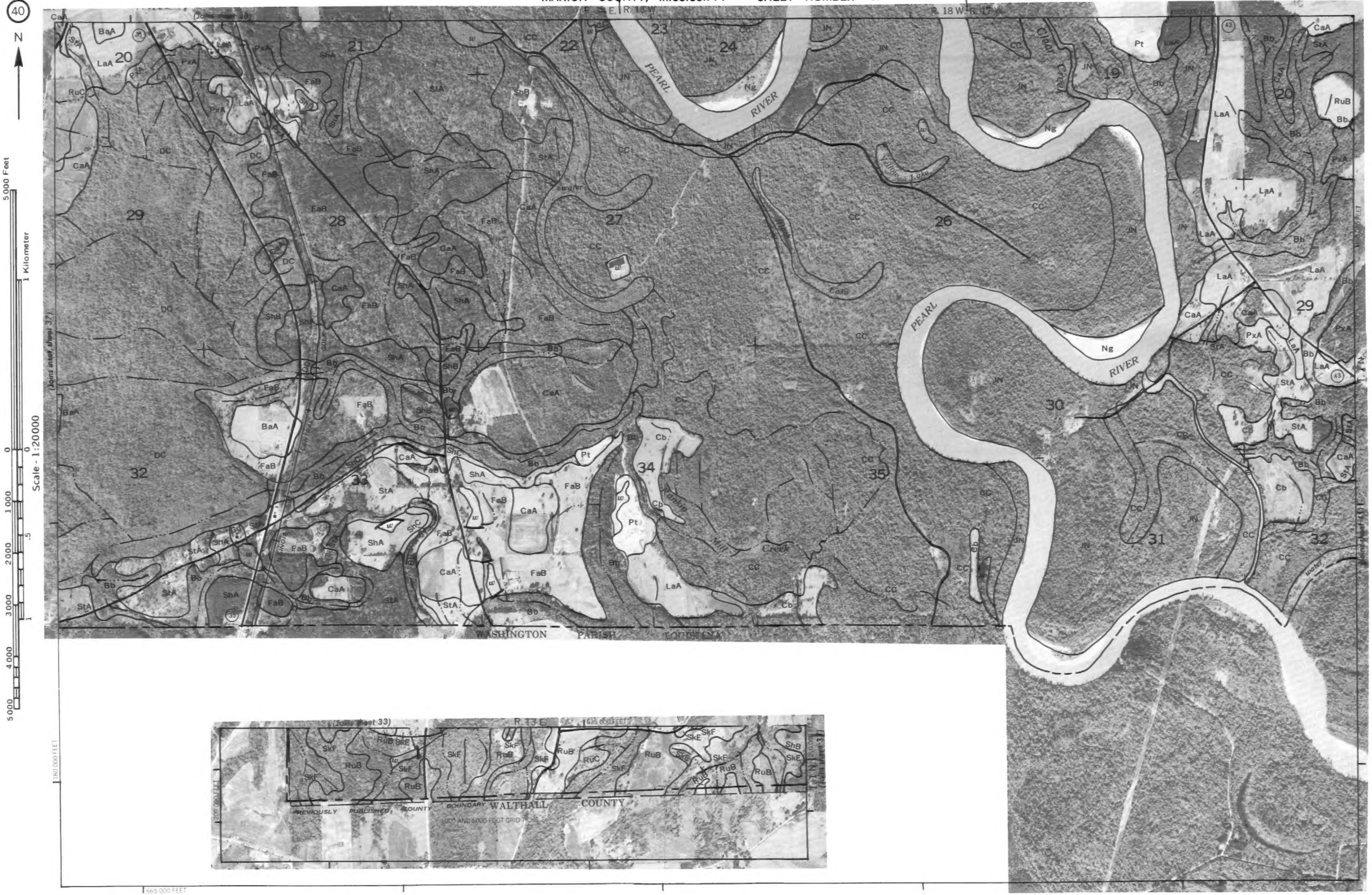
39

MARION COUNTY, MISSISSIPPI NO. 39

This soil survey map was compiled by the U. S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1979 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.





MARION COUNTY, MISSISSIPPI NO. 40

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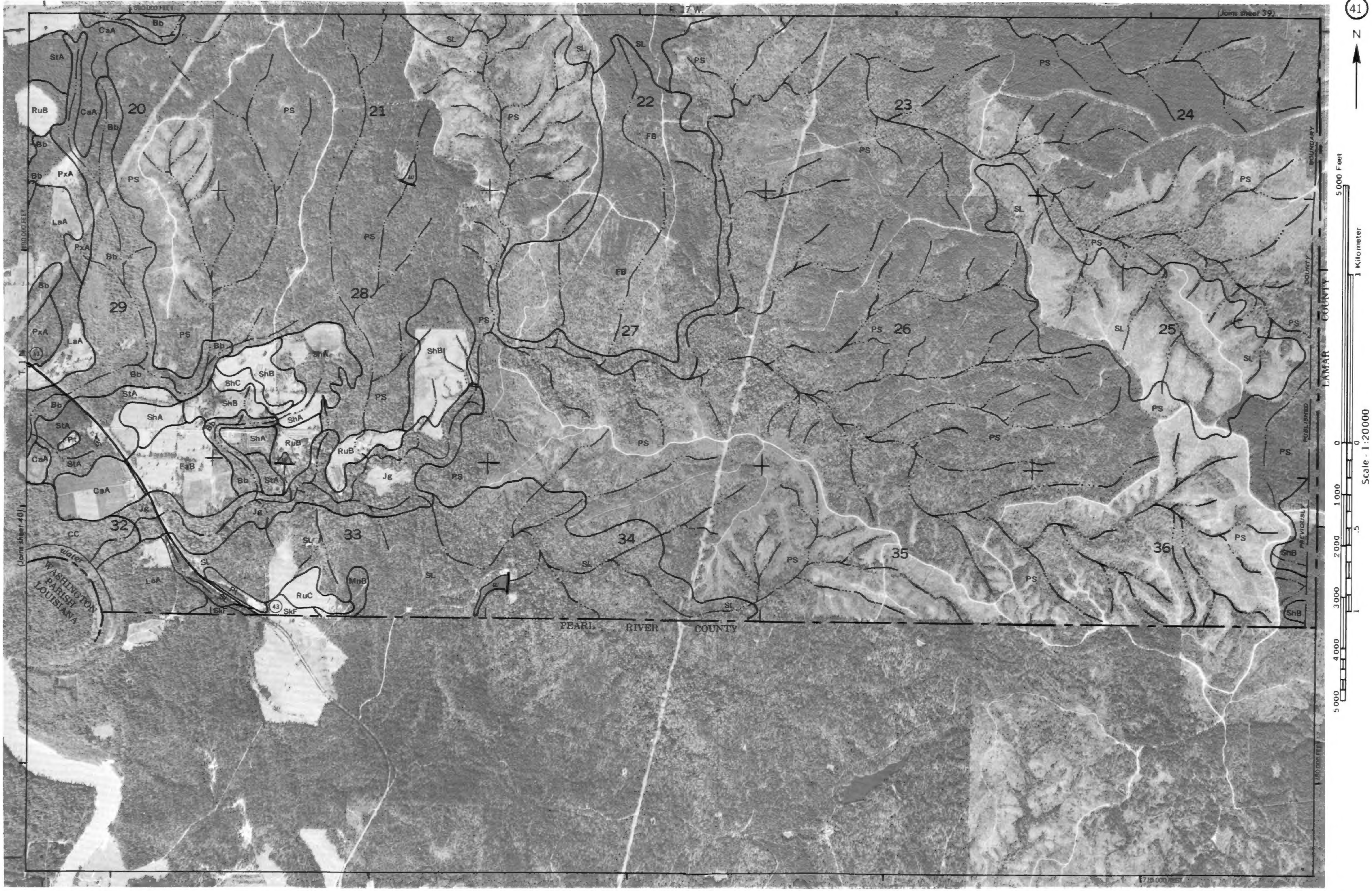

MARION COUNTY, MISSISSIPPI NO. 41

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